



1/46

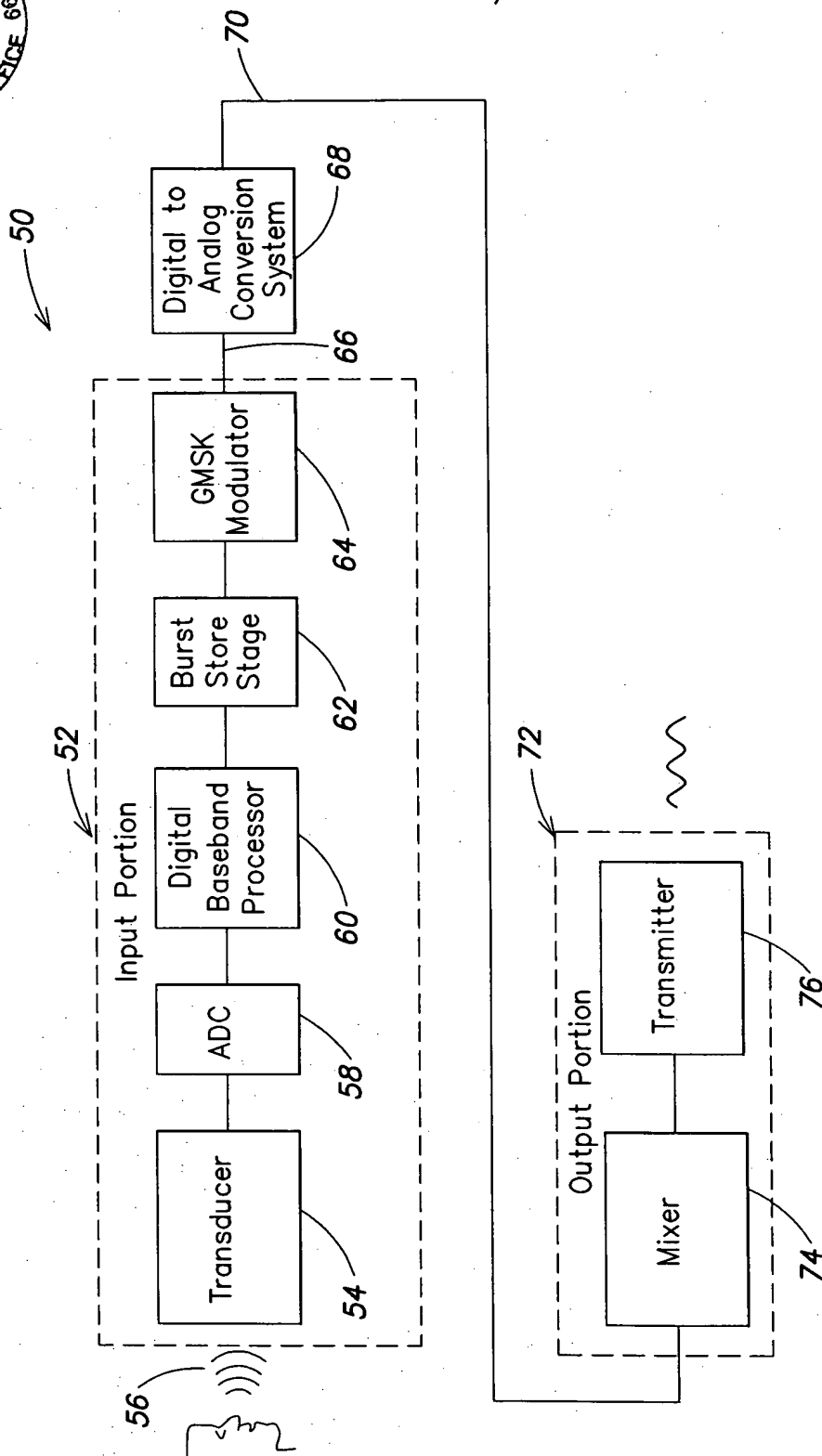


FIG. 1

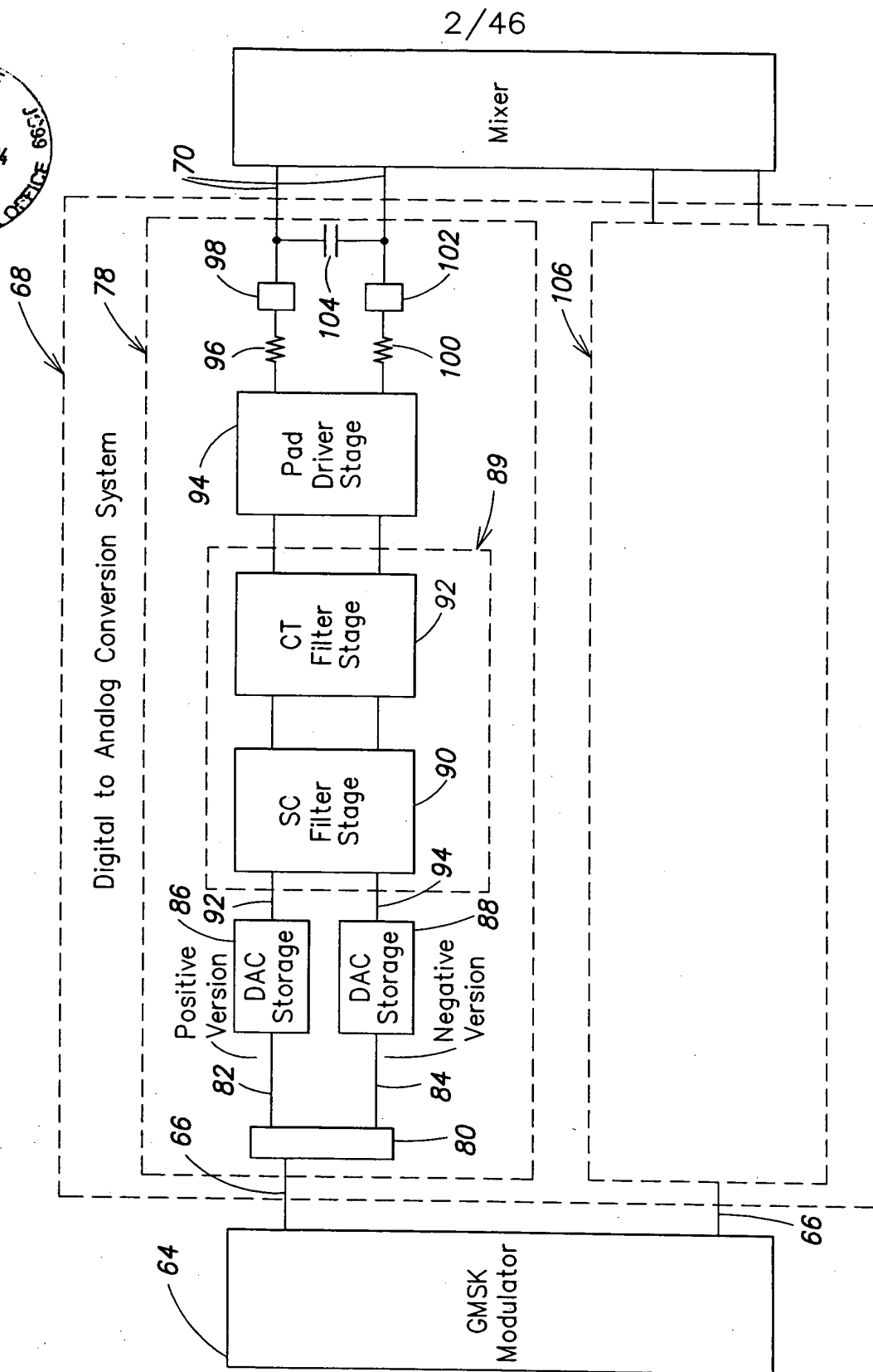


FIG. 2



3/46

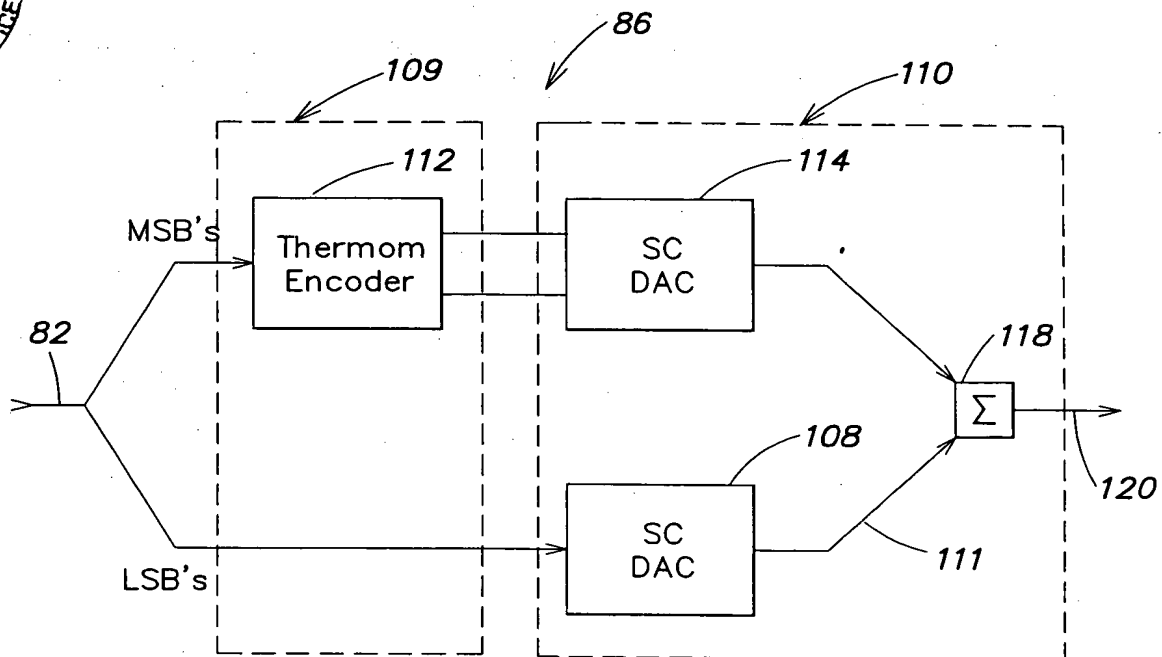


FIG. 3

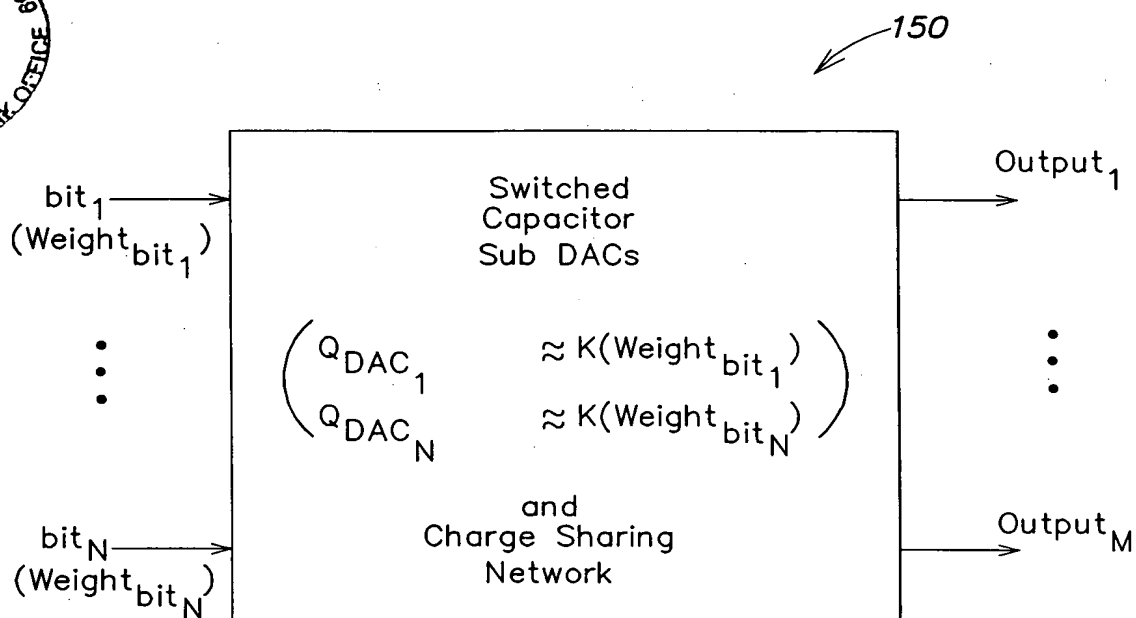


FIG. 4



6/46

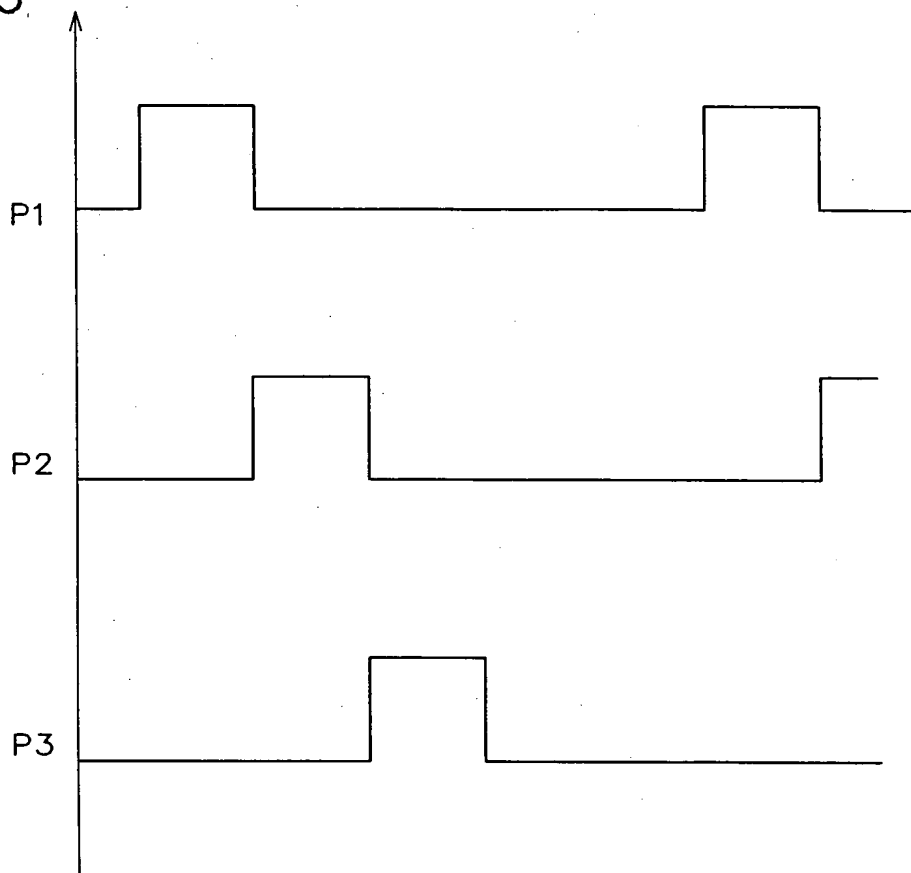


FIG. 6

OIPE
 MAR 04 2004
 PATENT & TRADEMARK OFFICE

OIPE
 MAR 05 2004
 CANCELLED
 PATENT & TRADEMARK OFFICE

5/46

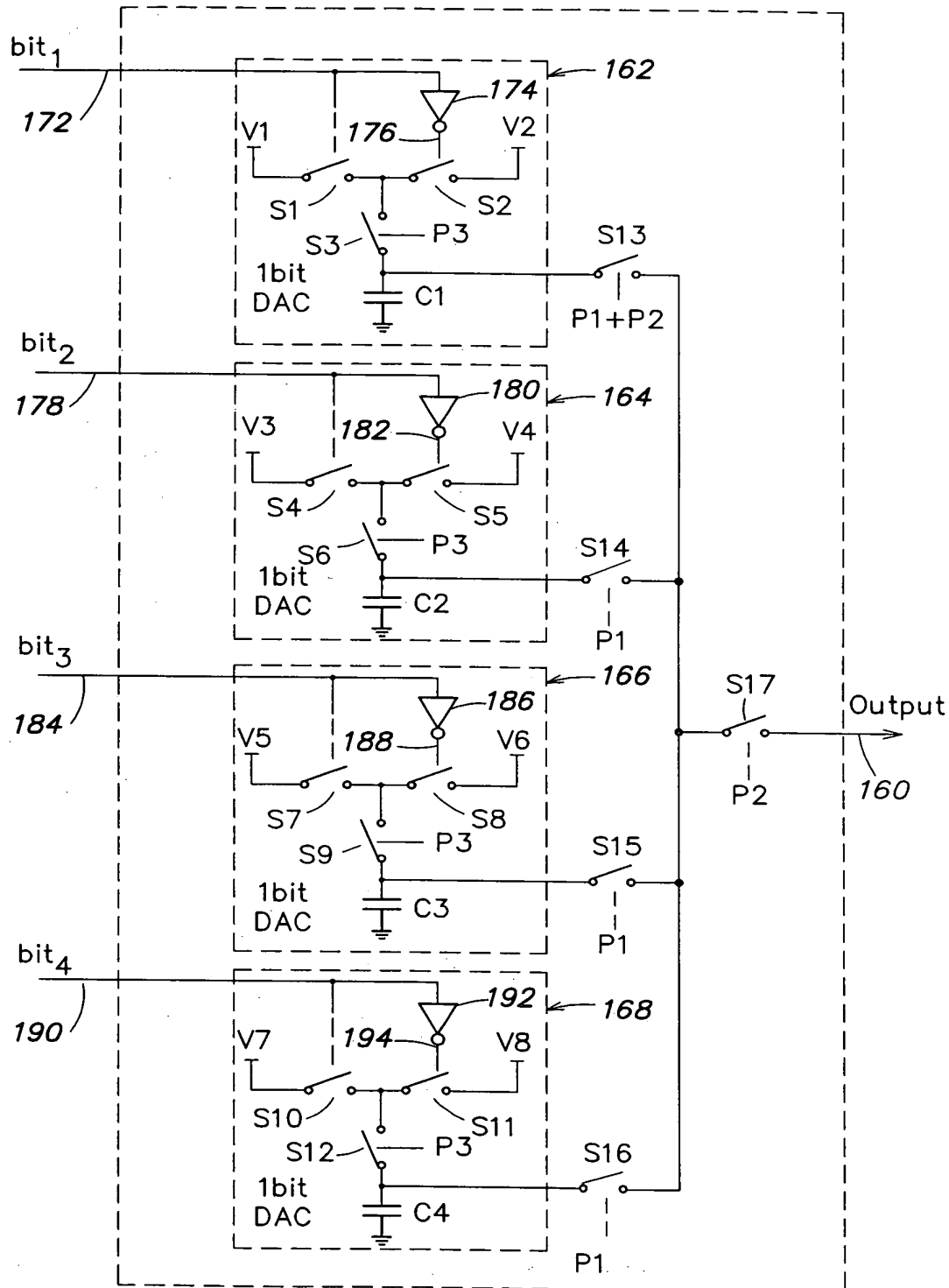


FIG. 5

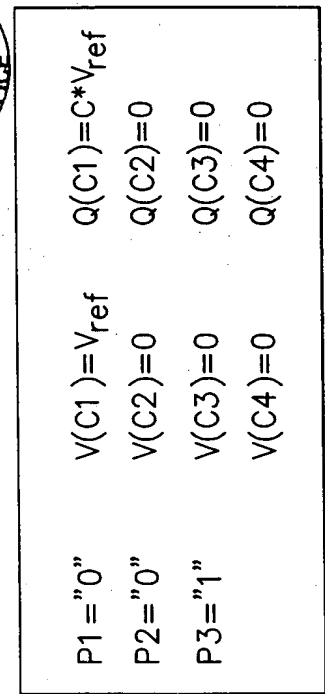


FIG. 7A

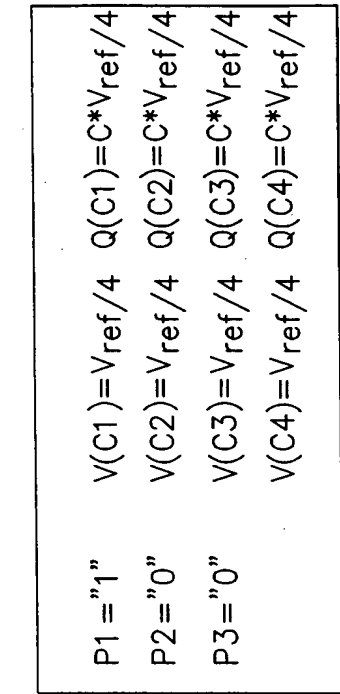


FIG. 7B



8/46

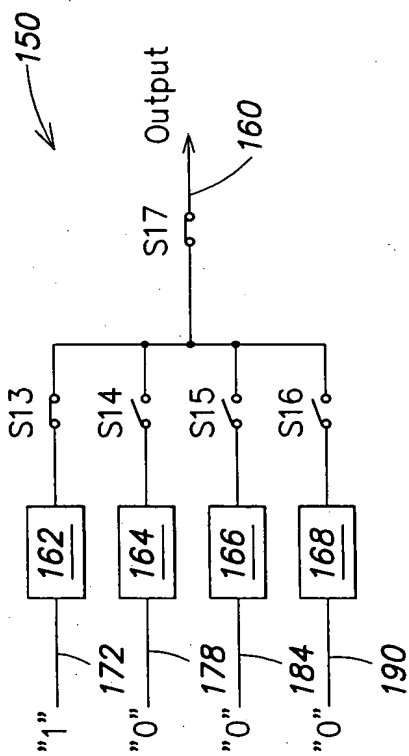


FIG. 7C

P1 = "0"	$V(C1) = V_{ref}/4$	$Q(C1) = C \cdot V_{ref}/4$
P2 = "1"	$V(C2) = V_{ref}/4$	$Q(C2) = C \cdot V_{ref}/4$
P3 = "0"	$V(C3) = V_{ref}/4$	$Q(C3) = C \cdot V_{ref}/4$
	$V(C4) = V_{ref}/4$	$Q(C4) = C \cdot V_{ref}/4$

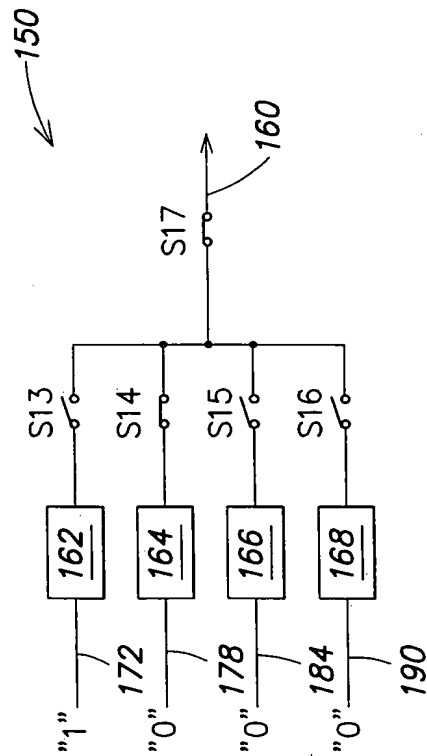


FIG. 10



P1 = 0	$V(C1) = V_{ref}$	$Q(C1) = C \cdot V_{ref}$
P2 = 0	$V(C2) = 0$	$Q(C2) = 0$
P3 = 1	$V(C3) = 0$	$Q(C3) = 0$
P4 = 0	$V(C4) = 0$	$Q(C4) = 0$

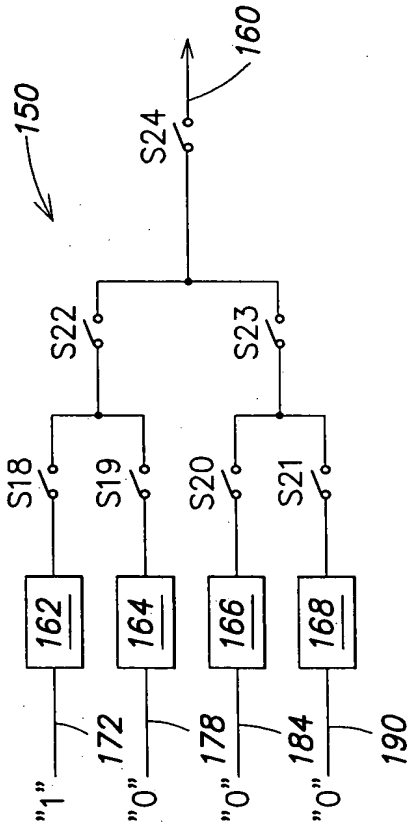


FIG. 8A

P1 = 0	$V(C1) = V_{ref}/2$	$Q(C1) = C \cdot V_{ref}/2$
P2 = 0	$V(C2) = V_{ref}/2$	$Q(C2) = C \cdot V_{ref}/2$
P3 = 0	$V(C3) = 0$	$Q(C3) = 0$
P4 = 1	$V(C4) = 0$	$Q(C4) = 0$

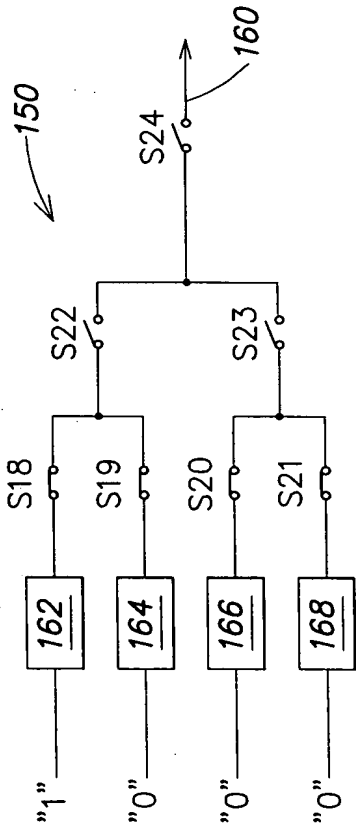


FIG. 8B



10/46

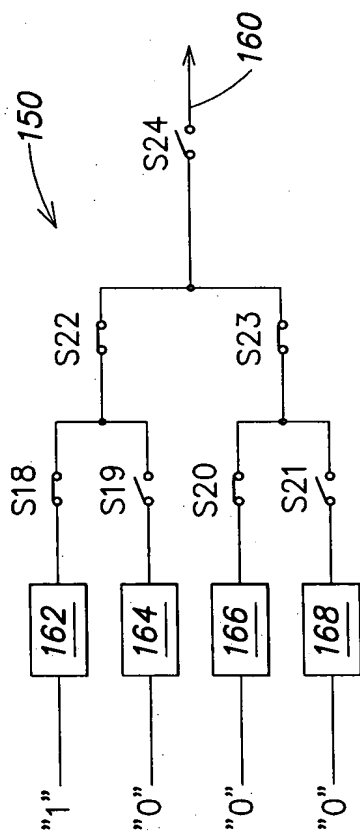


FIG. 8C

P1 = 1	$V(C1) = V_{ref}/4$	$Q(C1) = C \cdot V_{ref}/4$
P2 = 0	$V(C2) = V_{ref}/2$	$Q(C2) = C \cdot V_{ref}/2$
P3 = 0	$V(C3) = V_{ref}/4$	$Q(C3) = C \cdot V_{ref}/4$
P4 = 0	$V(C4) = 0$	$Q(C4) = 0$

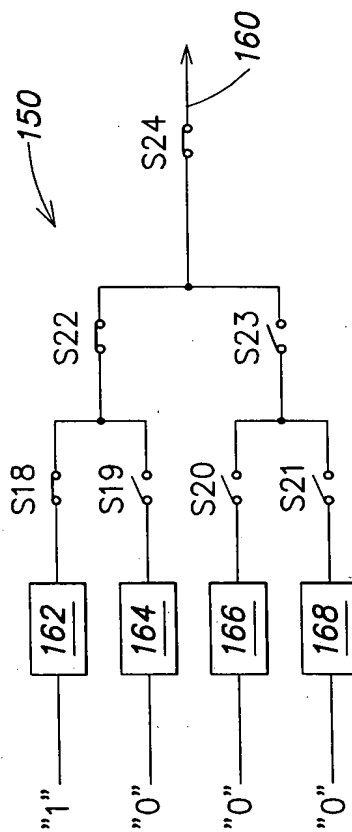


FIG. 8D

P1 = 0	$V(C1) = V_{ref}/4$	$Q(C1) = C \cdot V_{ref}/4$
P2 = 1	$V(C2) = V_{ref}/2$	$Q(C2) = C \cdot V_{ref}/2$
P3 = 0	$V(C3) = V_{ref}/4$	$Q(C3) = C \cdot V_{ref}/4$
P4 = 0	$V(C4) = 0$	$Q(C4) = 0$

11/46

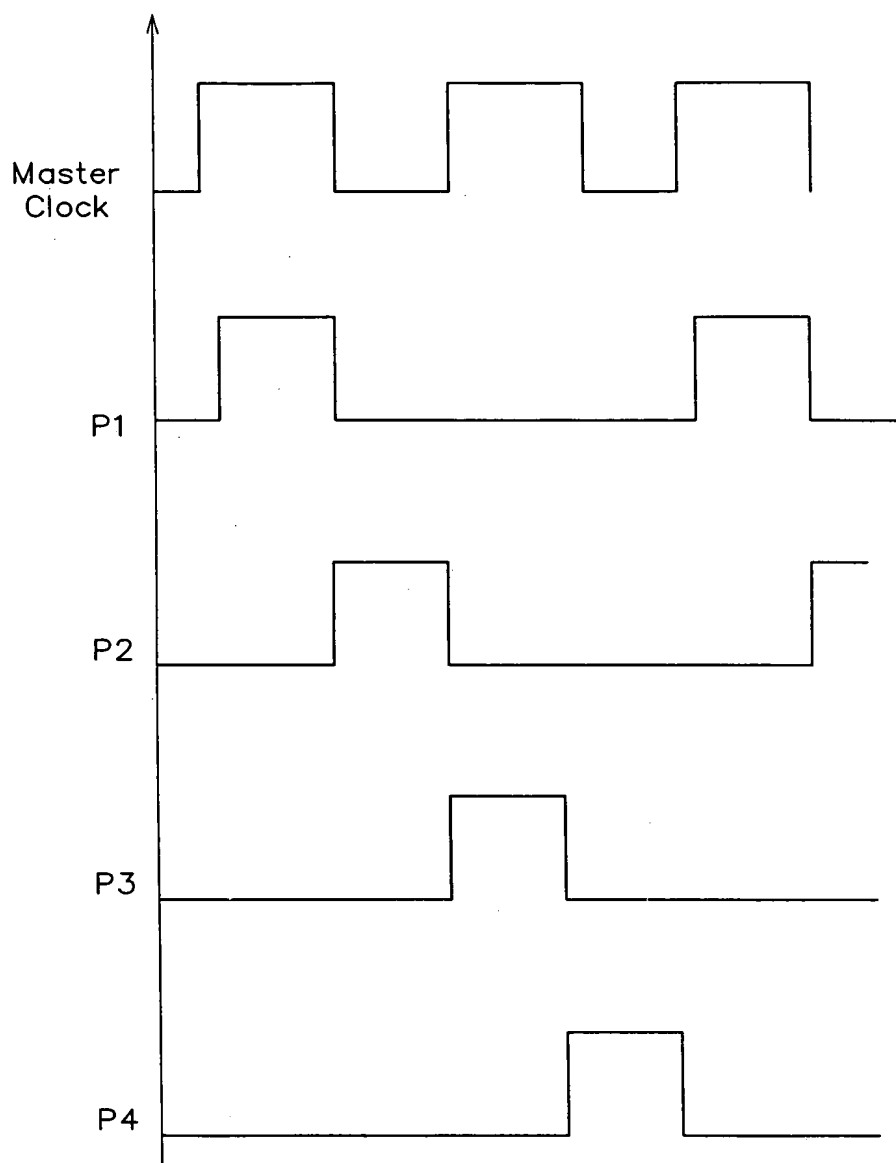


FIG. 9



12/46

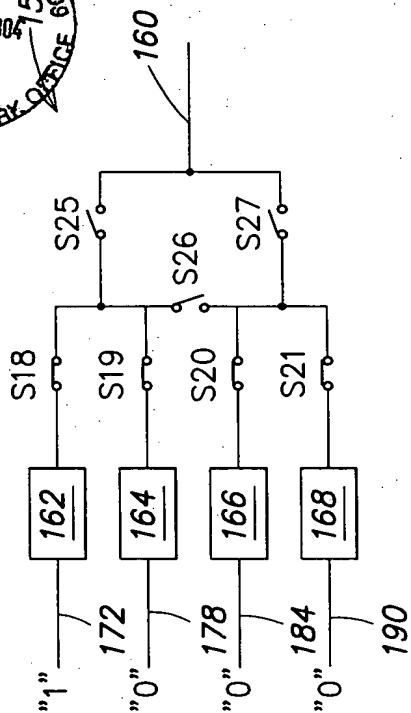


FIG. 11A

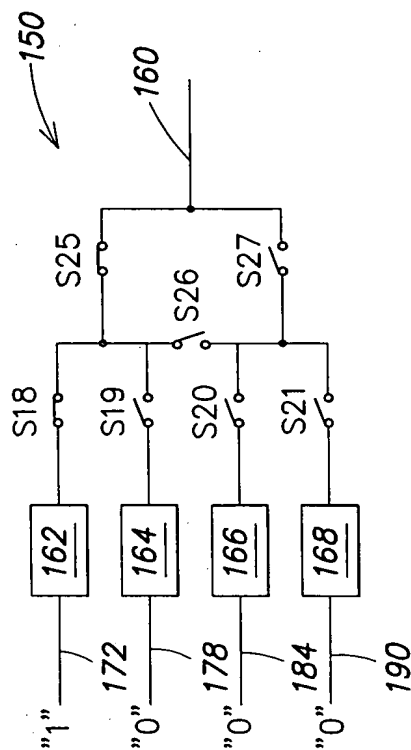


FIG. 11B

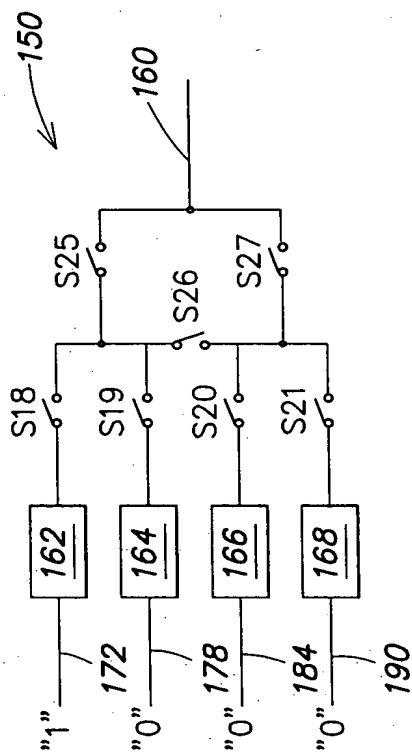


FIG. 11C

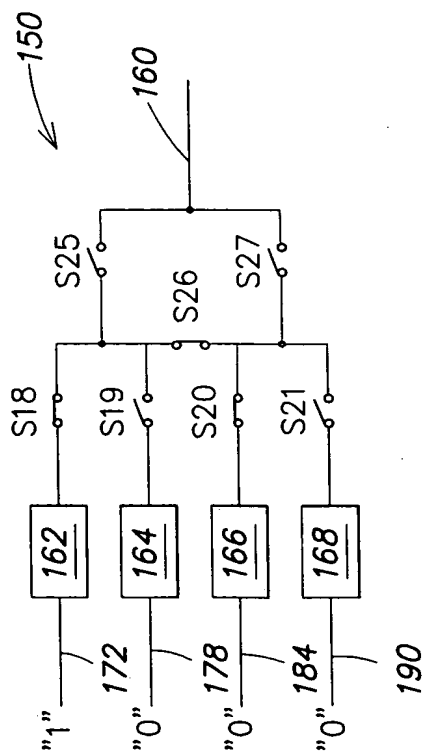


FIG. 11D

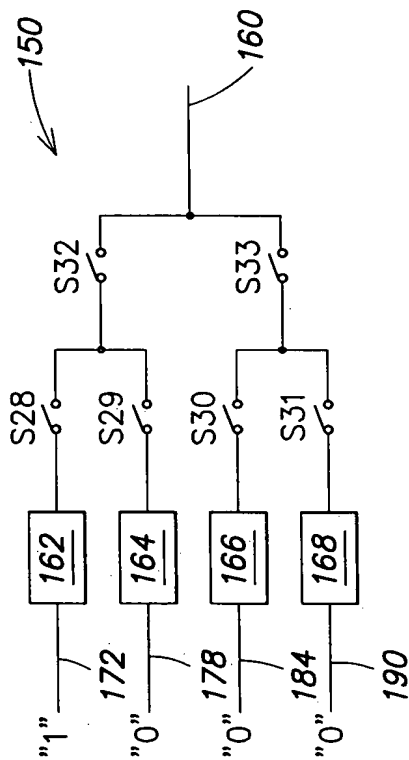
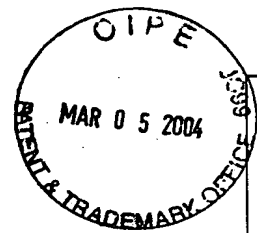


FIG. 12A

P1 = 0	$V(C1) = V_{ref}$	$Q(C1) = C \cdot V_{ref}$
P2 = 0	$V(C2) = 0$	$Q(C2) = 0$
P3 = 1	$V(C3) = 0$	$Q(C3) = 0$
	$V(C4) = 0$	$Q(C4) = 0$

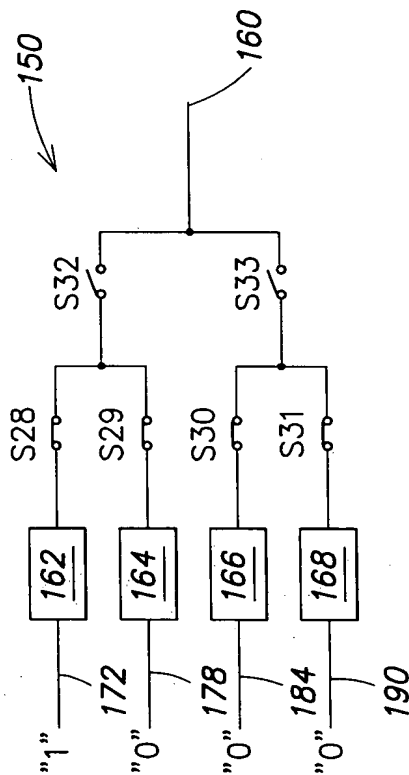


FIG. 12B

P1 = 1	$V(C1) = V_{ref}/2$	$Q(C1) = C \cdot V_{ref}/2$
P2 = 0	$V(C2) = V_{ref}/2$	$Q(C2) = C \cdot V_{ref}/2$
P3 = 0	$V(C3) = 0$	$Q(C3) = 0$
	$V(C4) = 0$	$Q(C4) = 0$



P1=0	$V(C1)=V_{ref}/2$	$Q(C1)=C \cdot V_{ref}/2$
P2=1	$V(C2)=V_{ref}/2$	$Q(C2)=C \cdot V_{ref}/2$
P3=0	$V(C3)=0$	$Q(C3)=0$
	$V(C4)=0$	$Q(C4)=0$

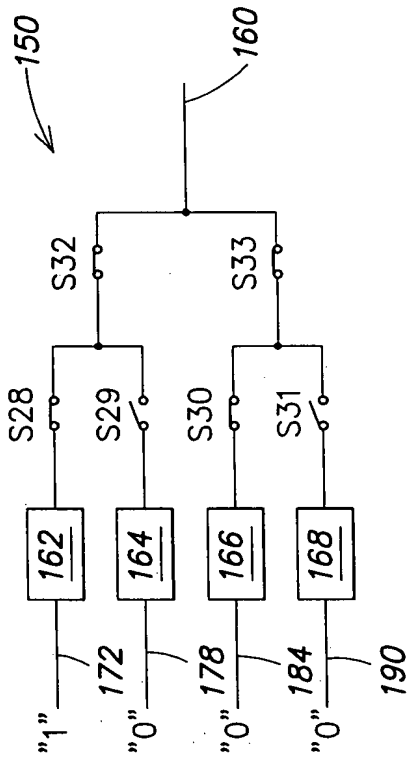


FIG. 12C

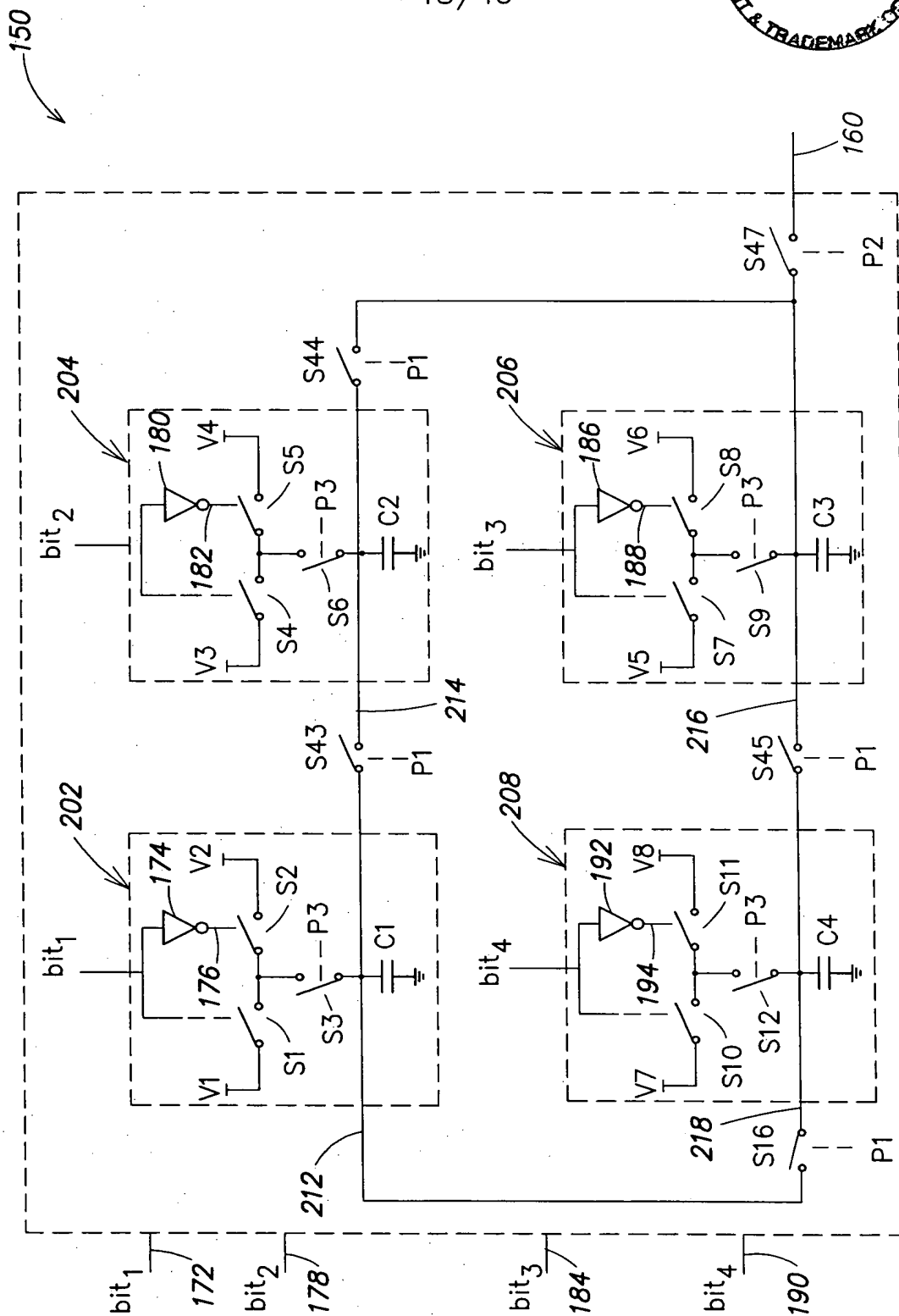
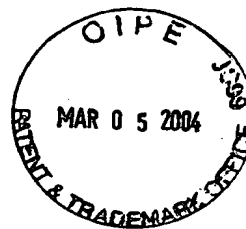
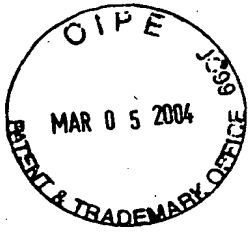


FIG. 13



16/46

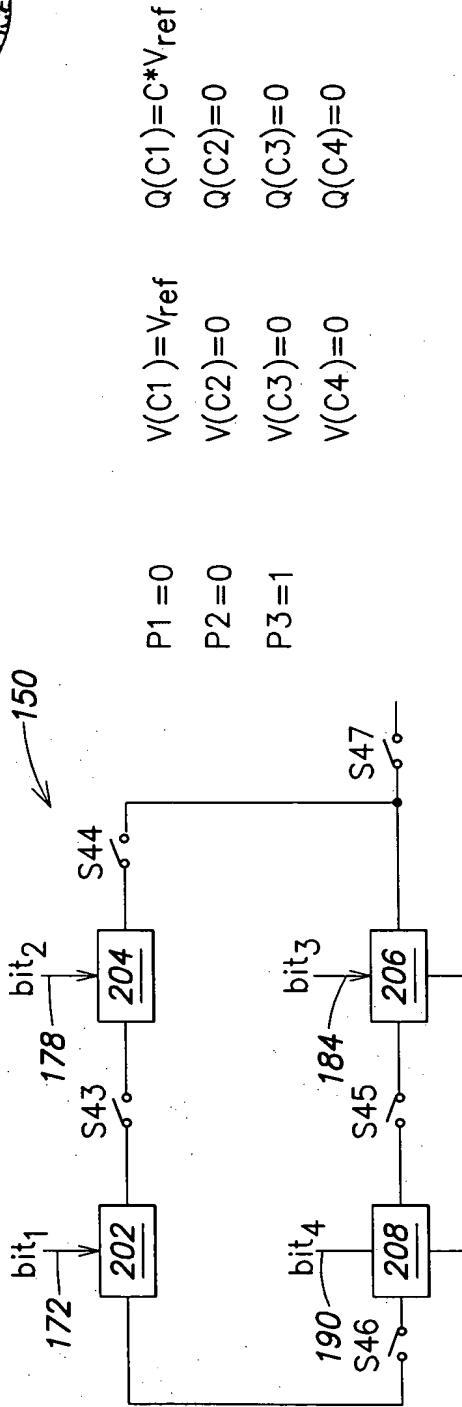


FIG. 14A

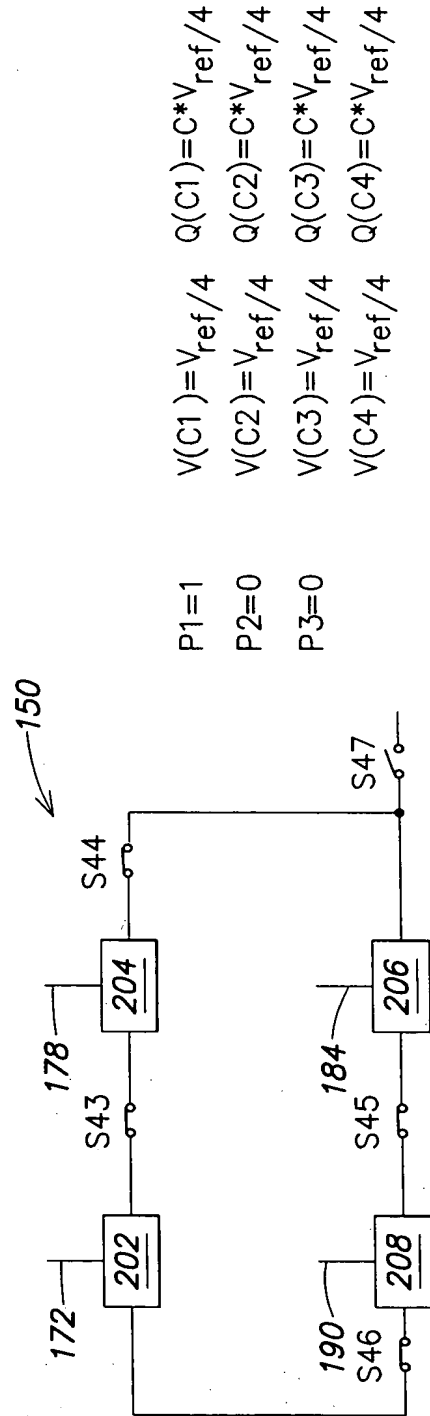
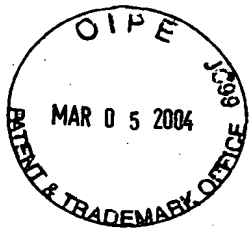
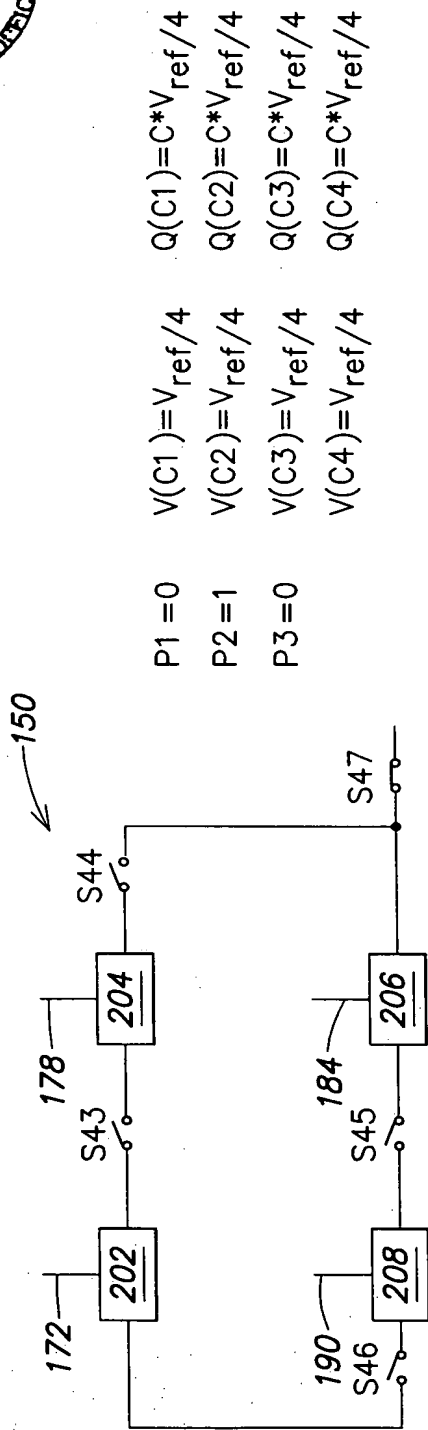


FIG. 14B



17/46



$$\begin{aligned} P1 &= 0 & V(C1) &= V_{ref}/4 & Q(C1) &= C \cdot V_{ref}/4 \\ P2 &= 1 & V(C2) &= V_{ref}/4 & Q(C2) &= C \cdot V_{ref}/4 \\ P3 &= 0 & V(C3) &= V_{ref}/4 & Q(C3) &= C \cdot V_{ref}/4 \\ & & V(C4) &= V_{ref}/4 & Q(C4) &= C \cdot V_{ref}/4 \end{aligned}$$

FIG. 14C

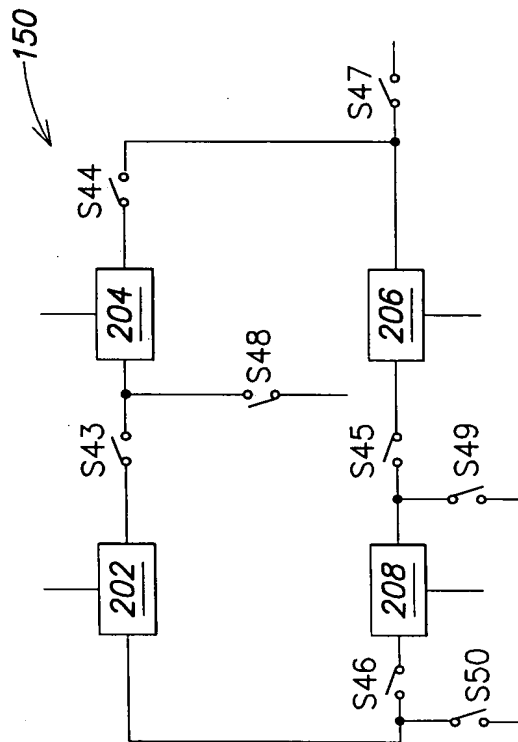
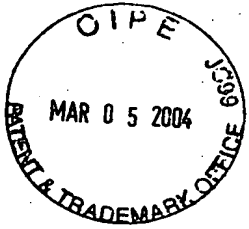


FIG. 15



18/46

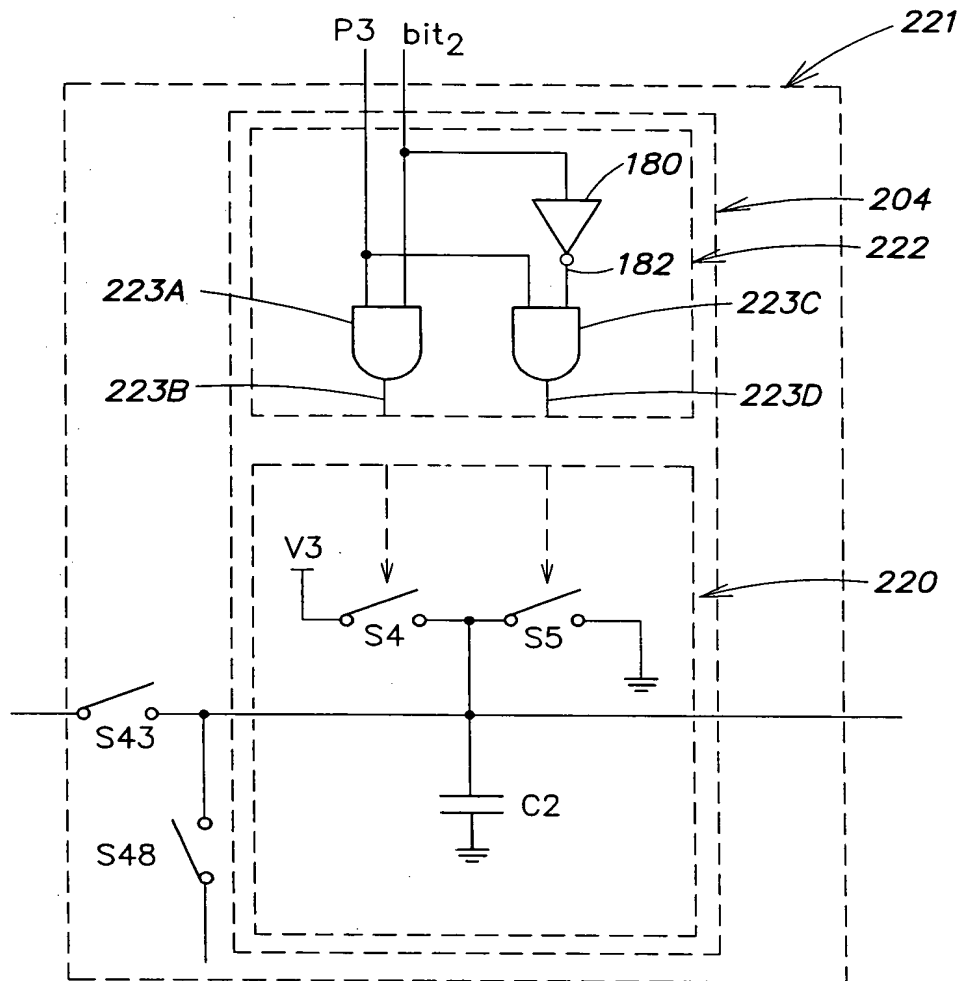


FIG. 16A

19/46

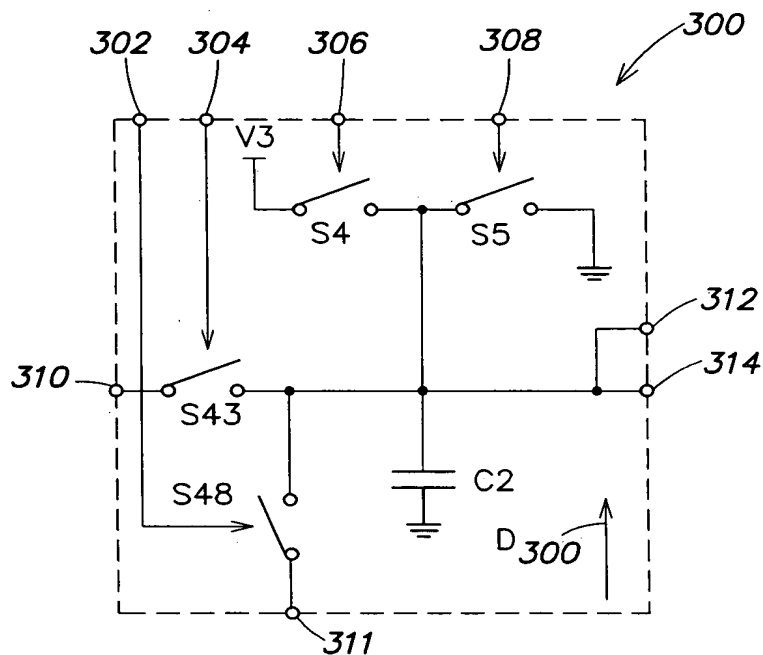
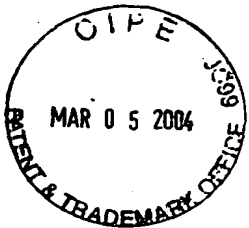


FIG. 16B



20/46

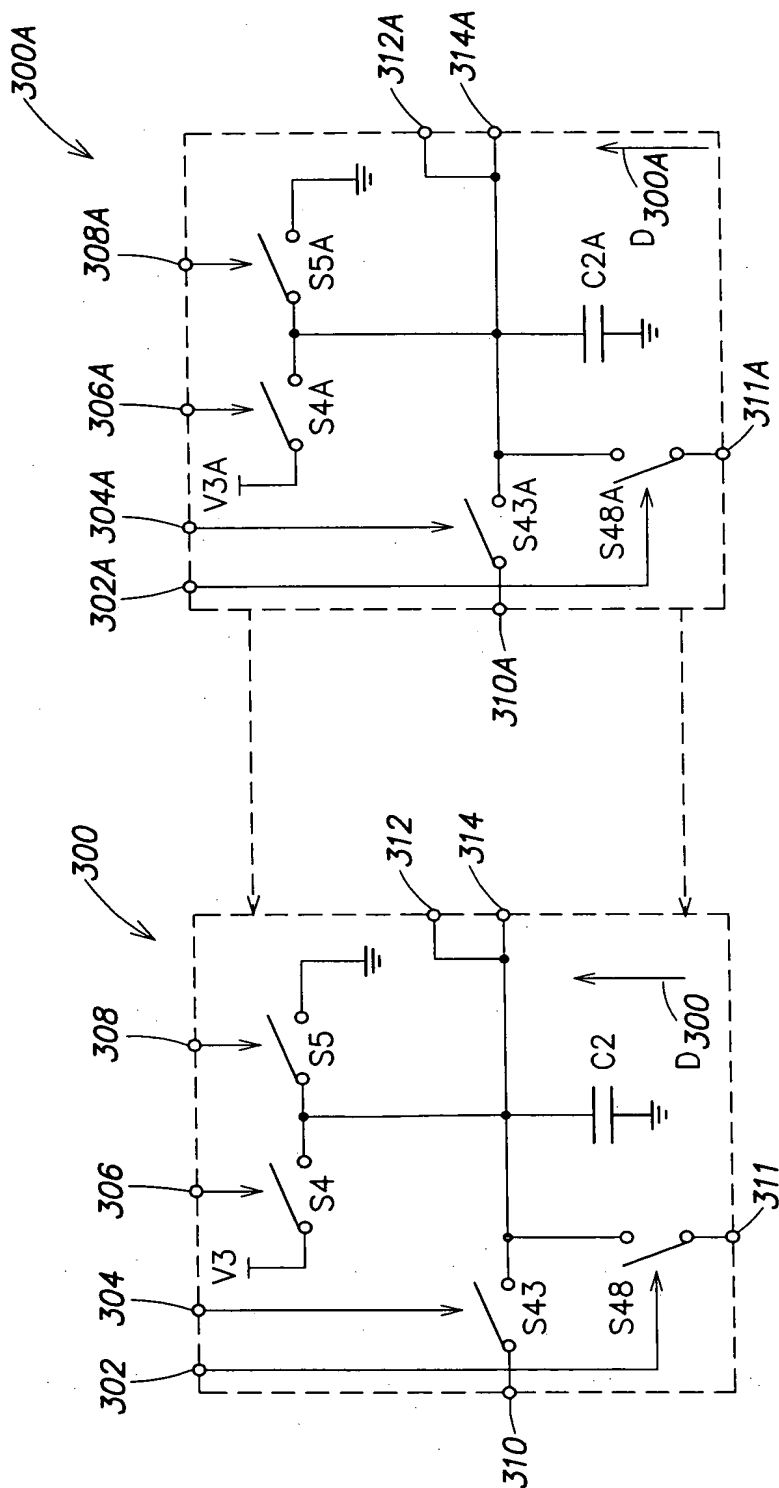


FIG. 16C

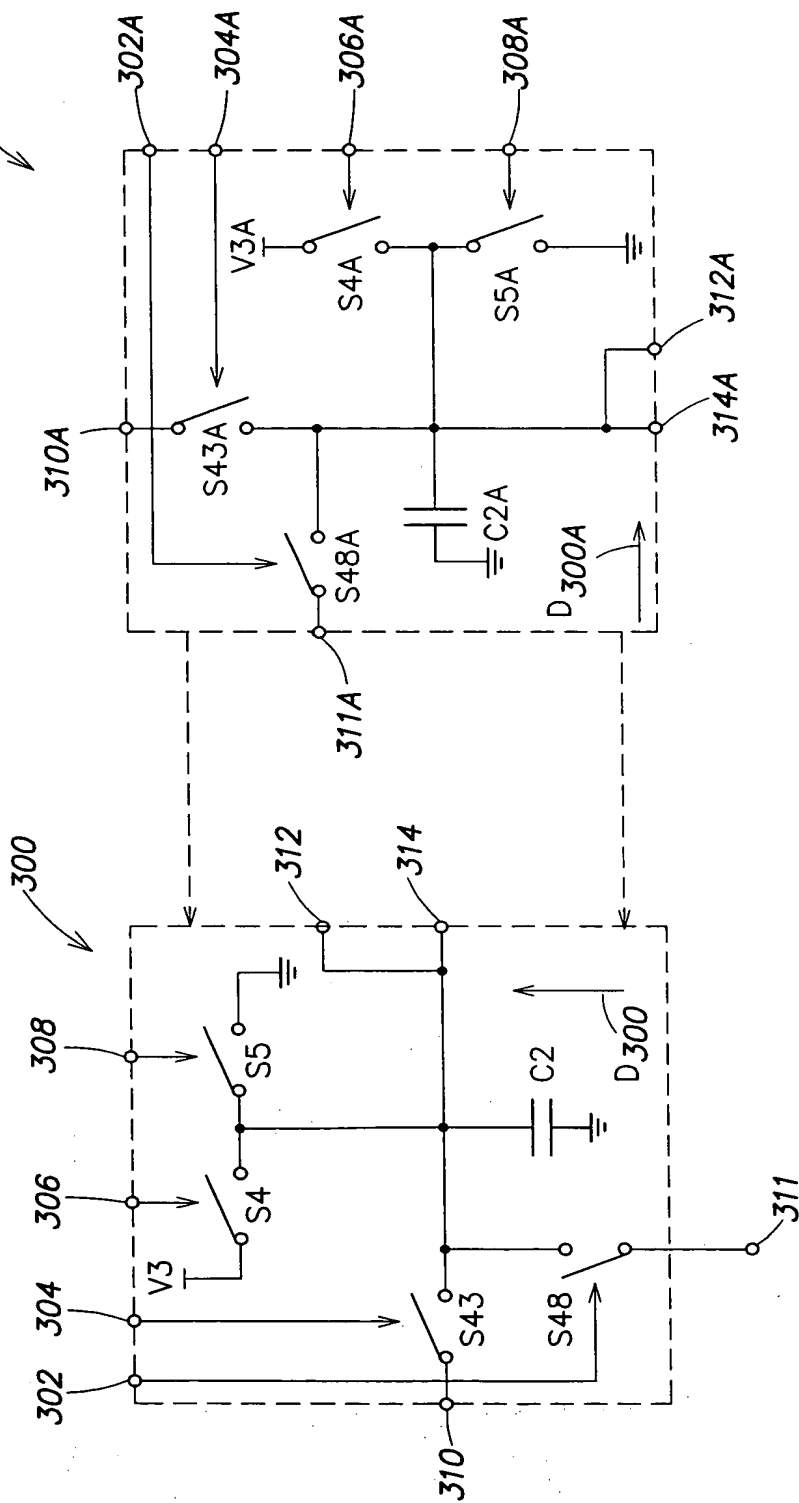


FIG. 16D

22/46

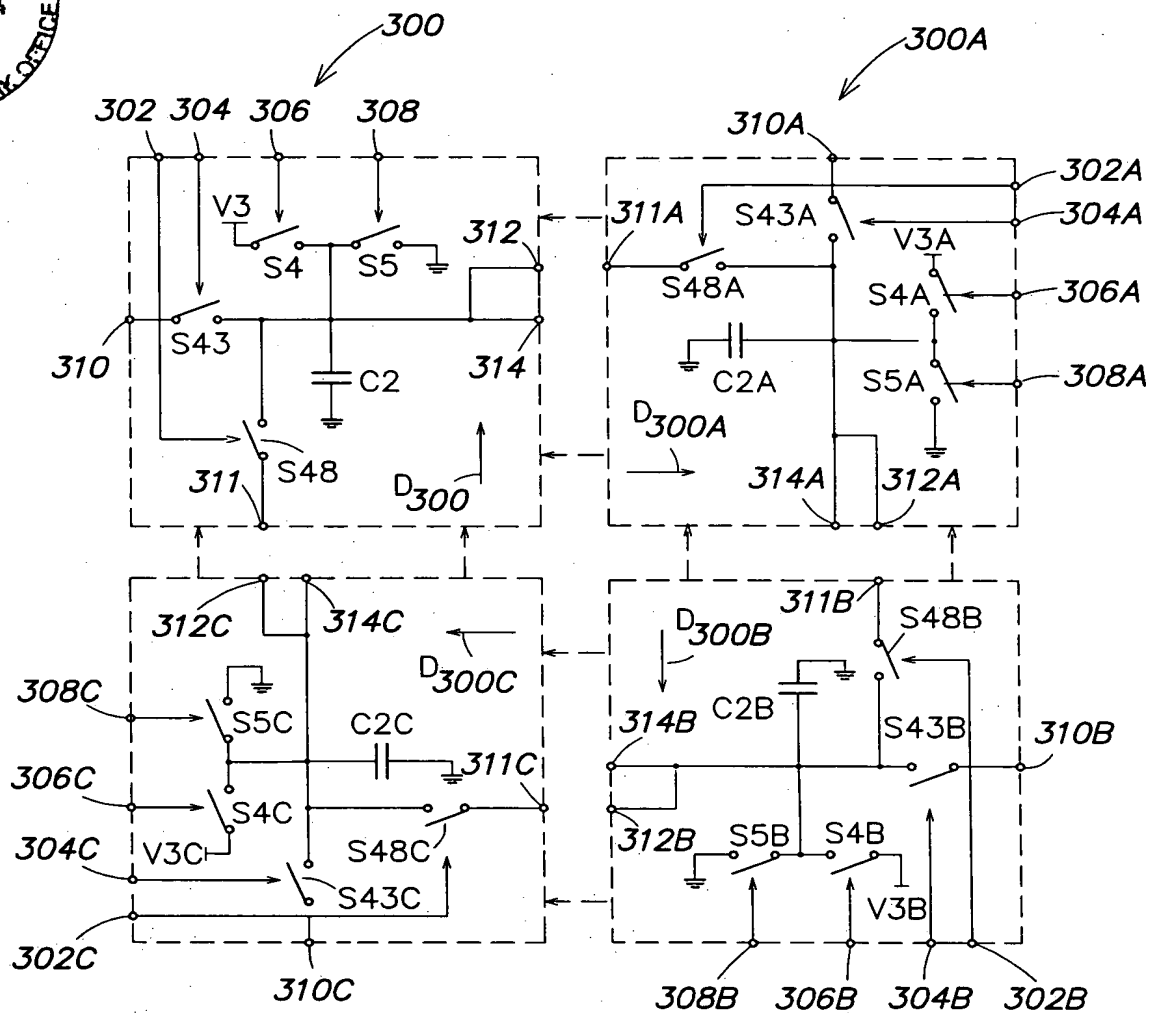
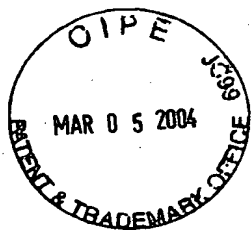


FIG. 16E

23/46

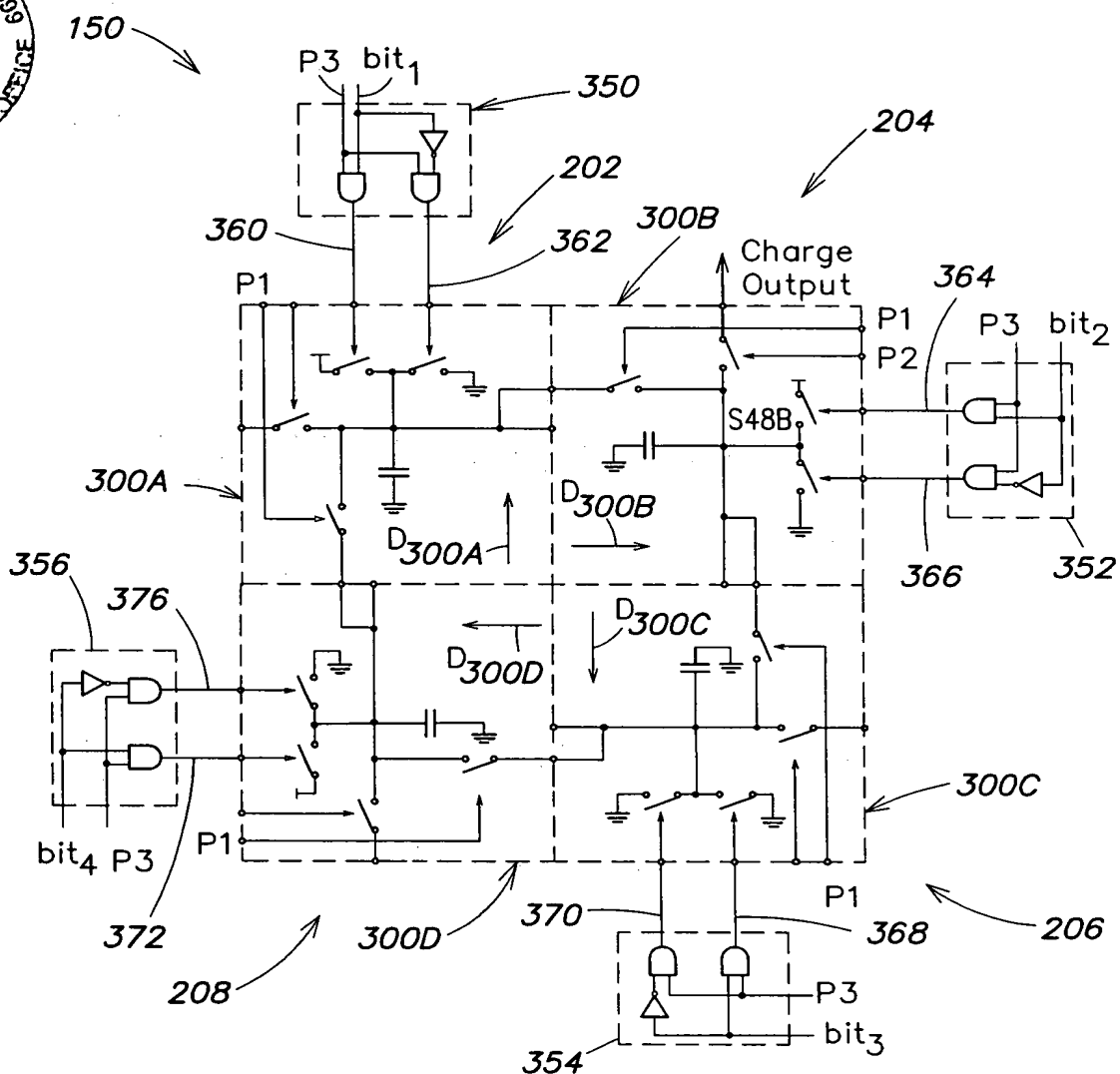


FIG. 17

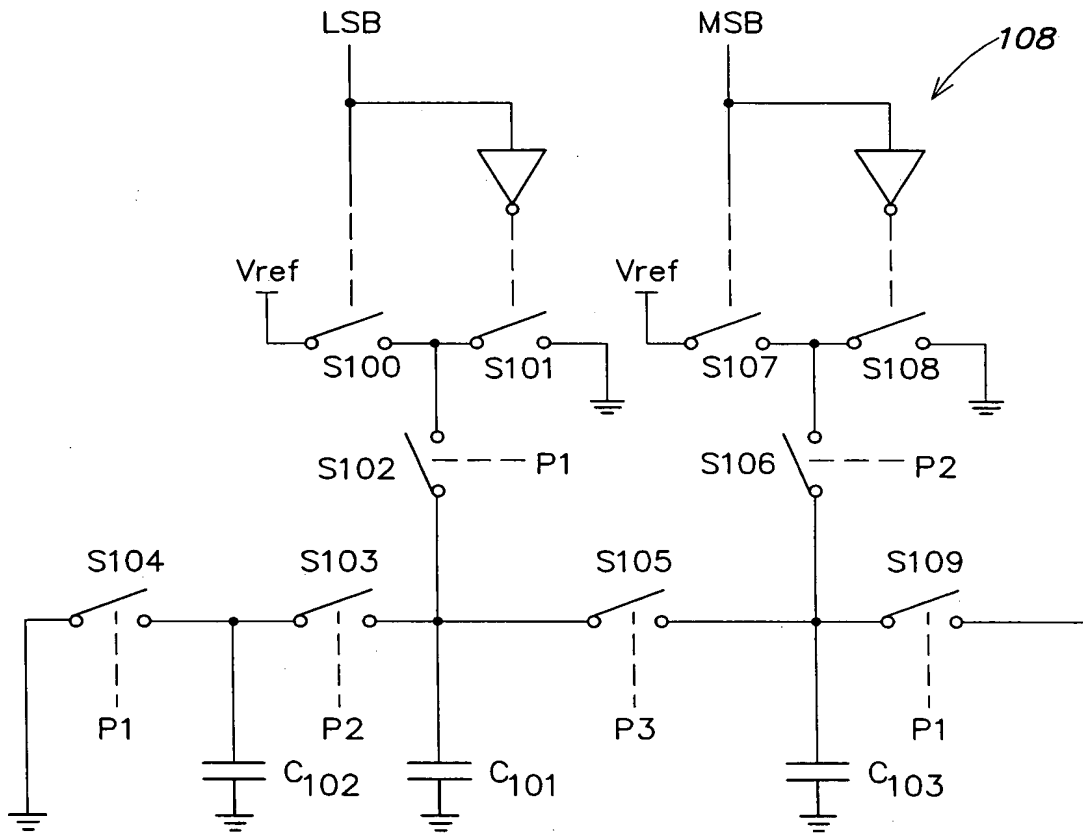
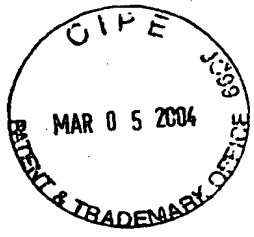
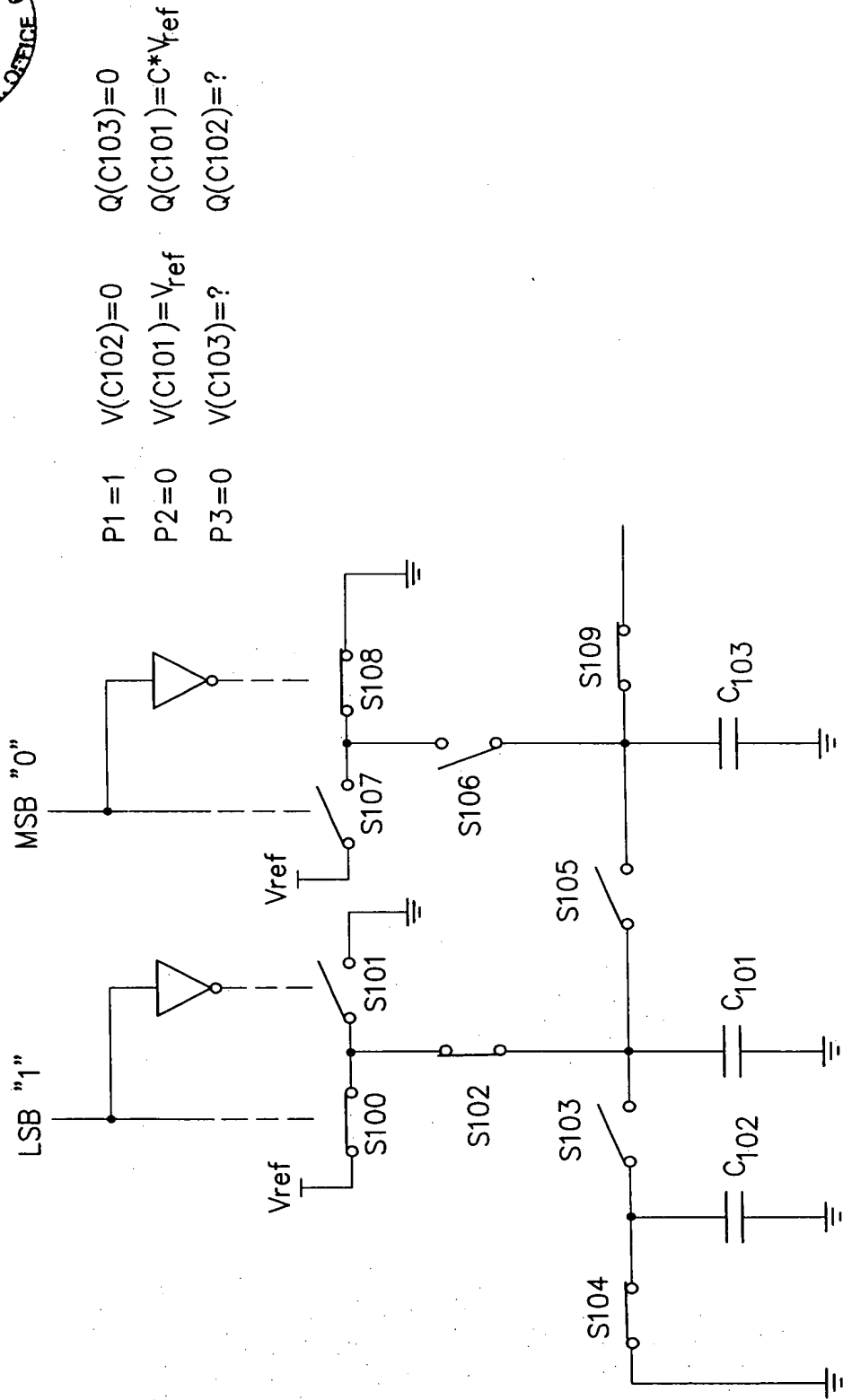
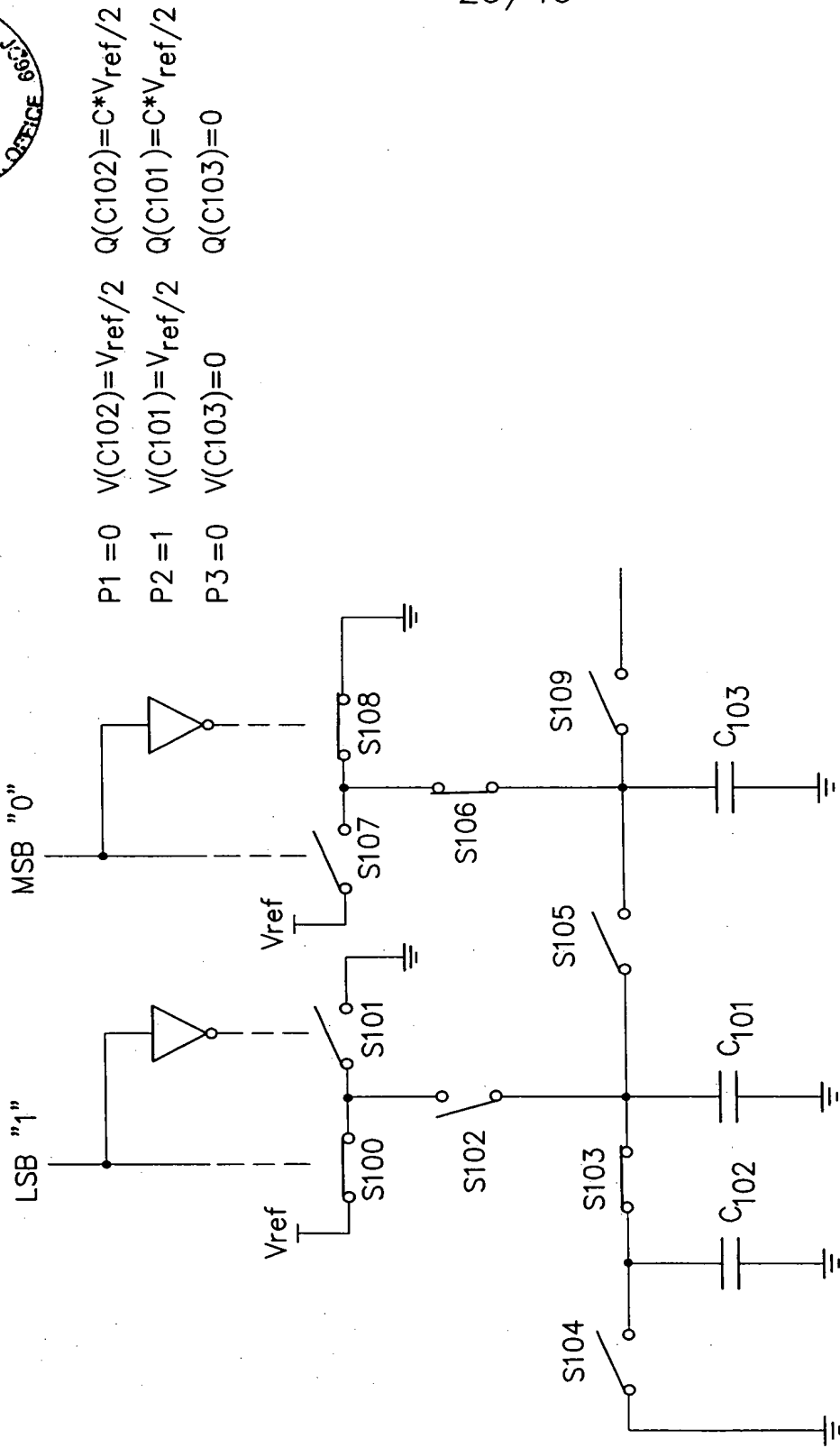


FIG. 18



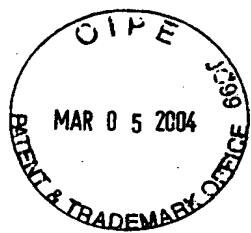
P1 = 1 V(C102) = 0 Q(C103) = 0
P2 = 0 V(C101) = V_{ref} Q(C101) = C * V_{ref}
P3 = 0 V(C103) = ? Q(C102) = ?

FIG. 19A



P1 = 0 $V(C102) = V_{ref}/2$ $Q(C102) = C \cdot V_{ref}/2$
P2 = 1 $V(C101) = V_{ref}/2$ $Q(C101) = C \cdot V_{ref}/2$
P3 = 0 $V(C103) = 0$ $Q(C103) = 0$

FIG. 19B



27/46

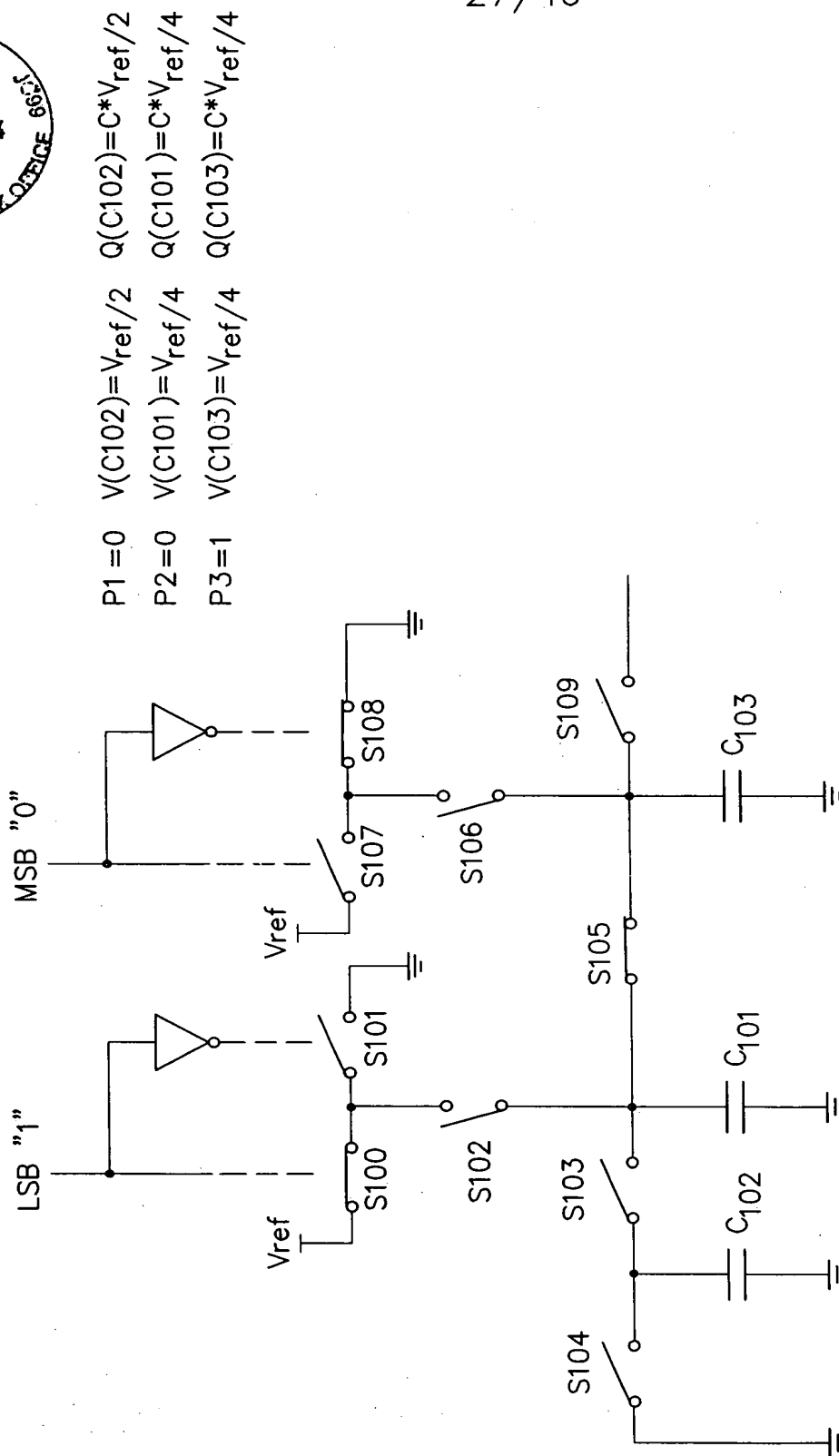


FIG. 19C

28/46

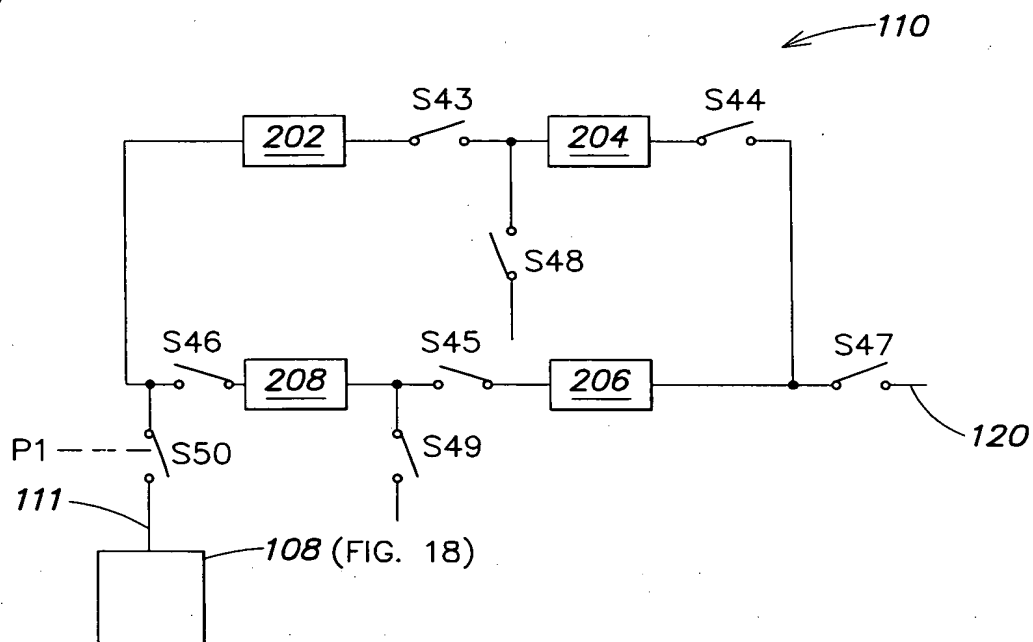


FIG. 20

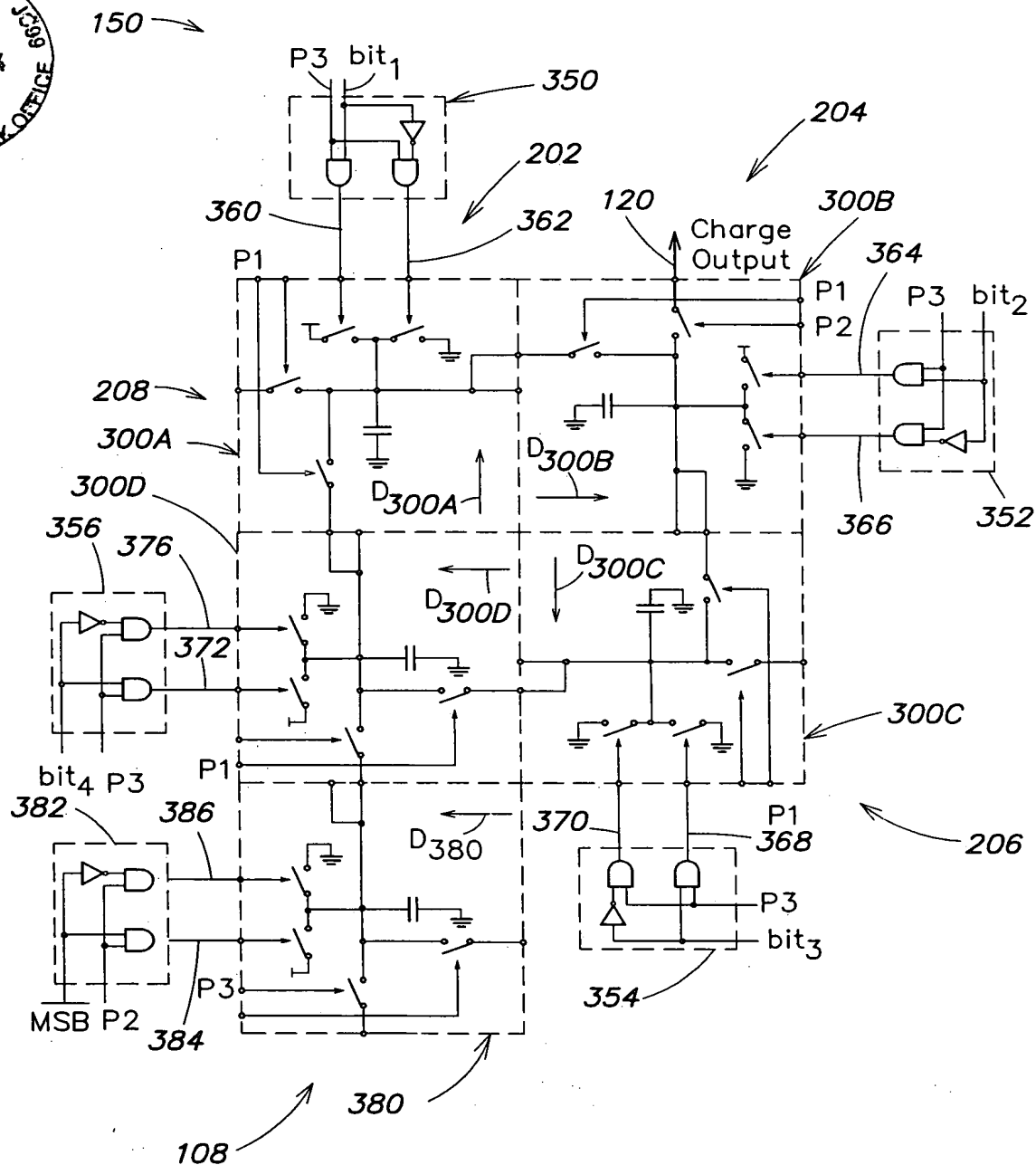
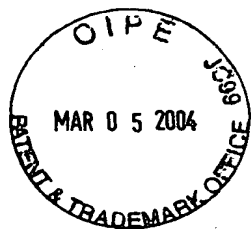


FIG. 21

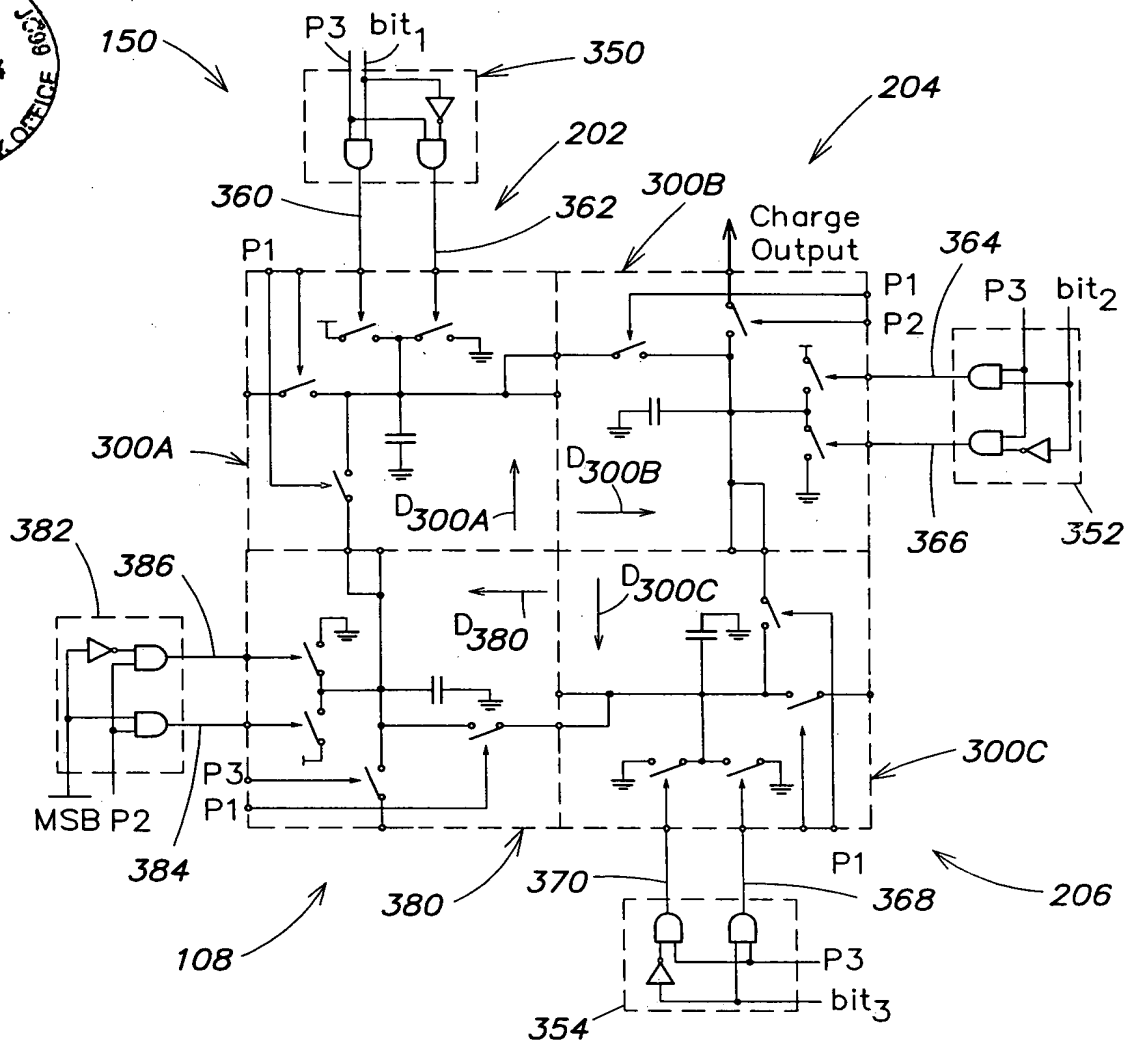
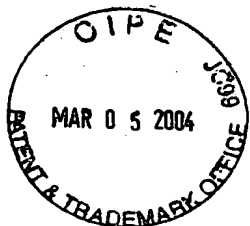


FIG. 22

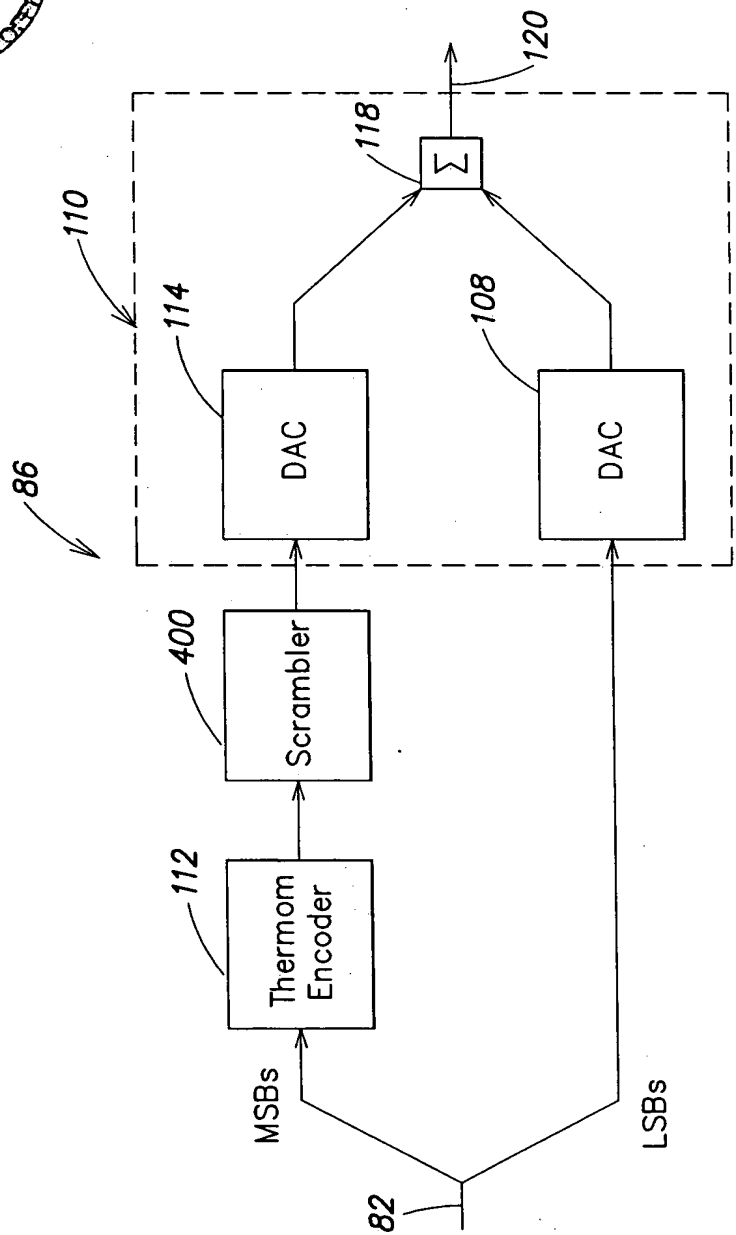


FIG. 23



32/46

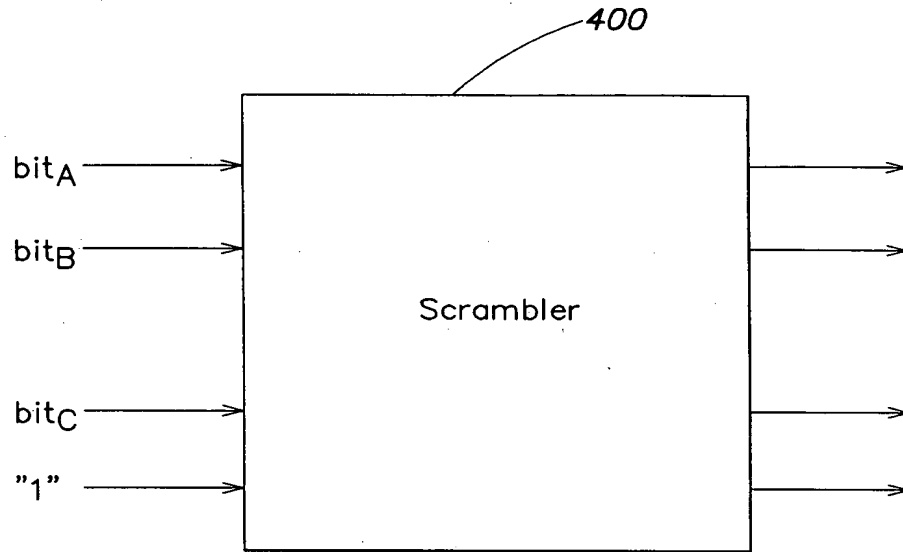


FIG. 24

33/46

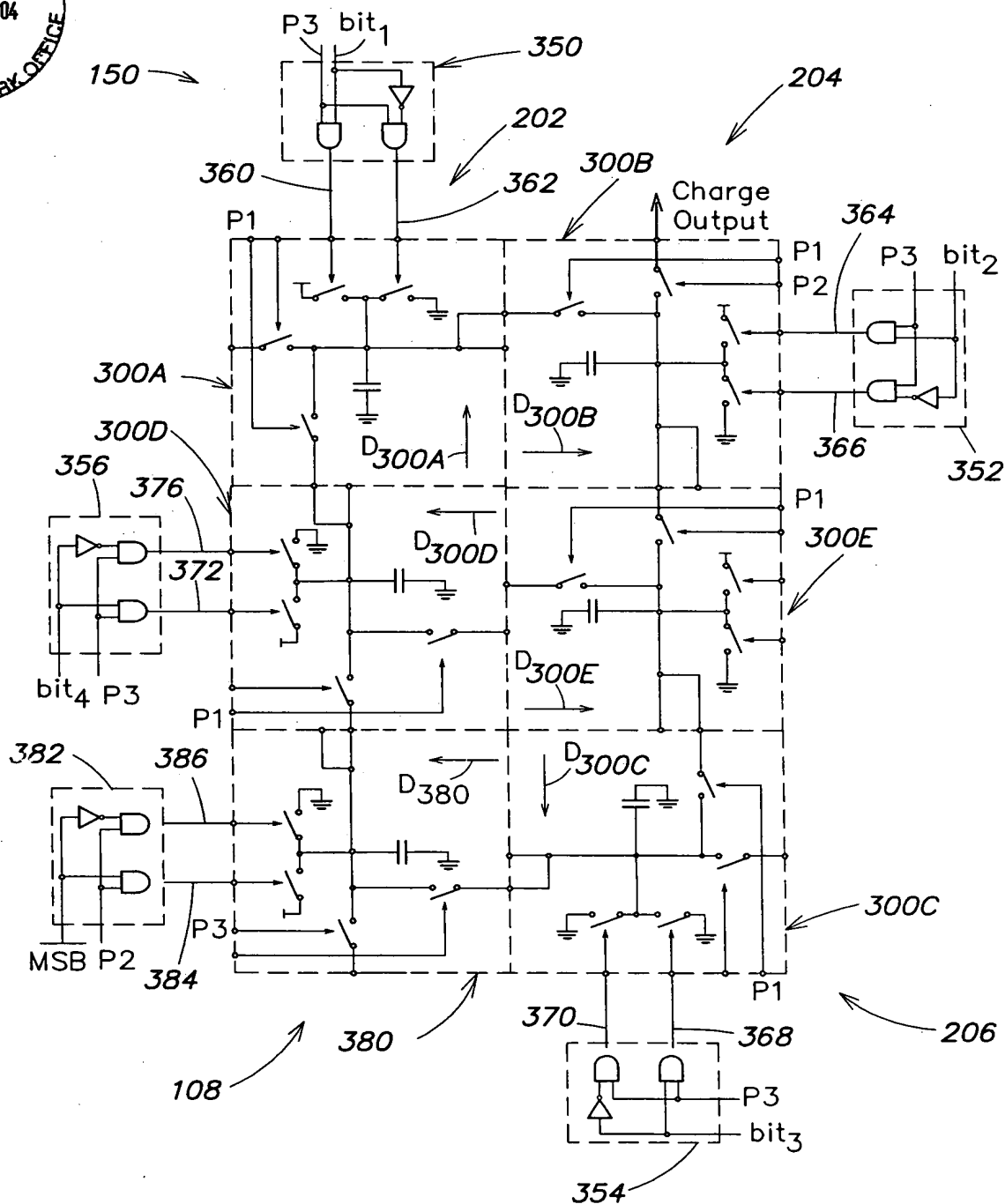


FIG. 25

34/46

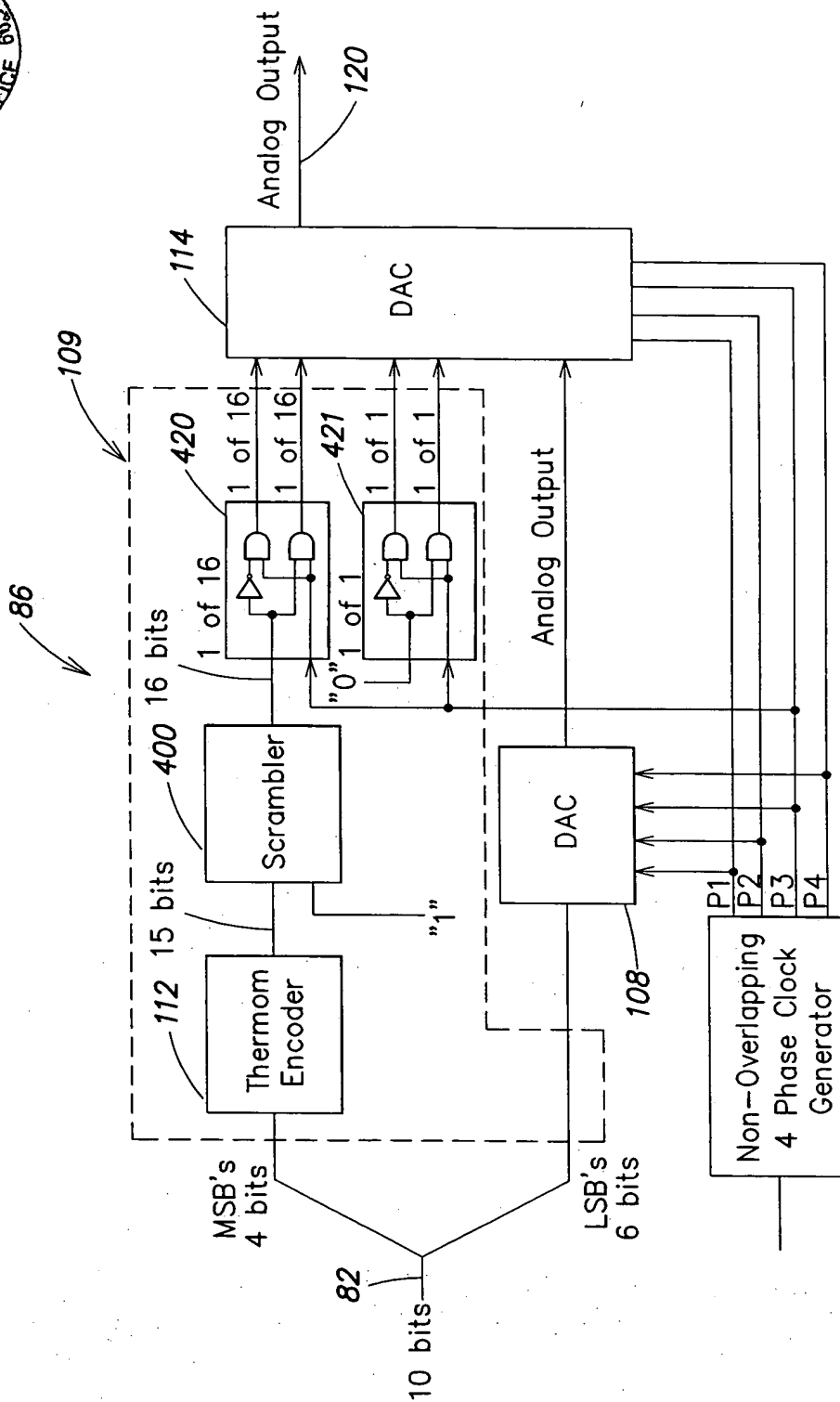


FIG. 26

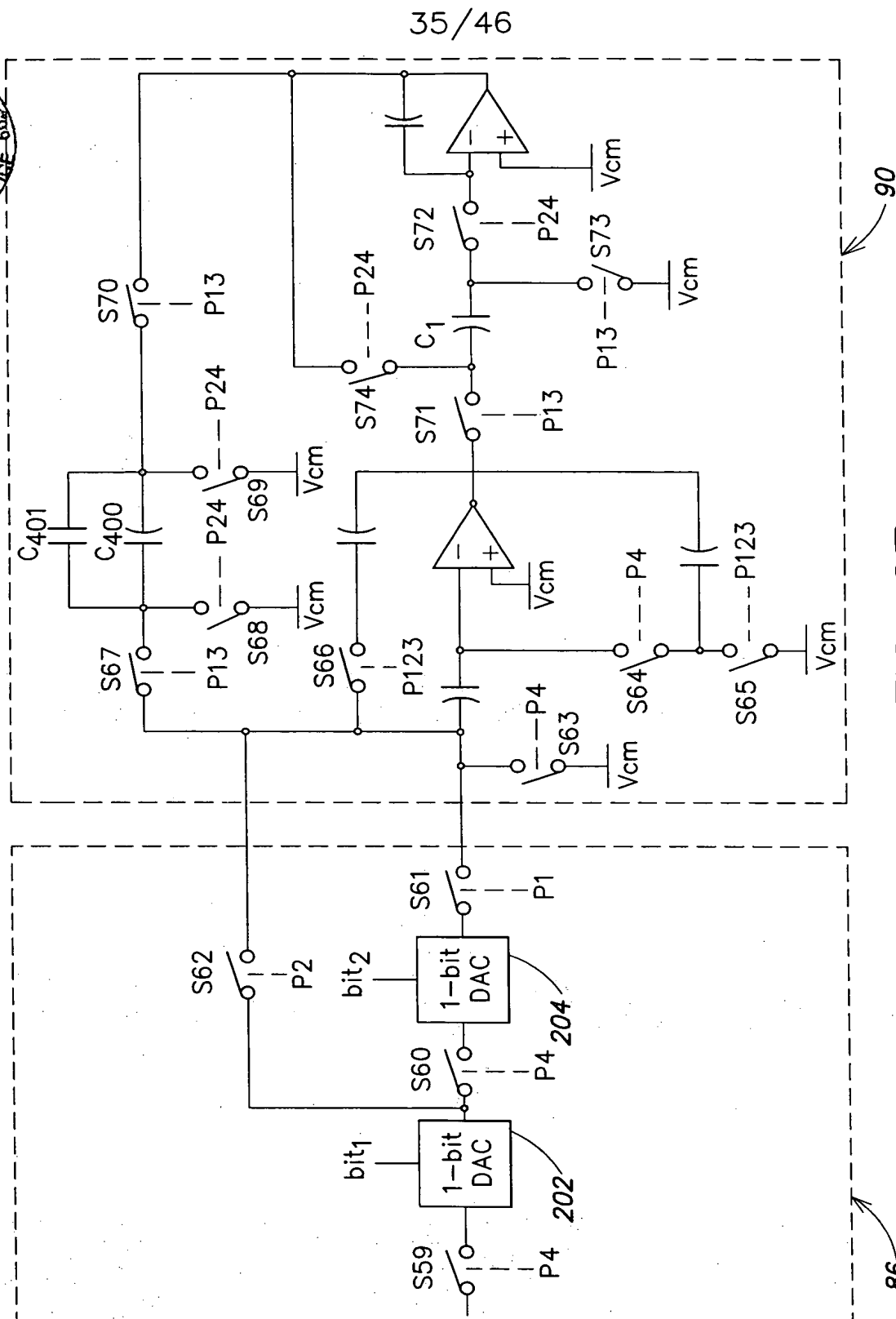
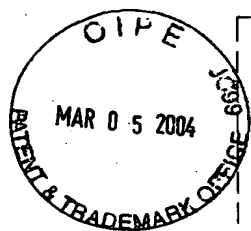


FIG. 27

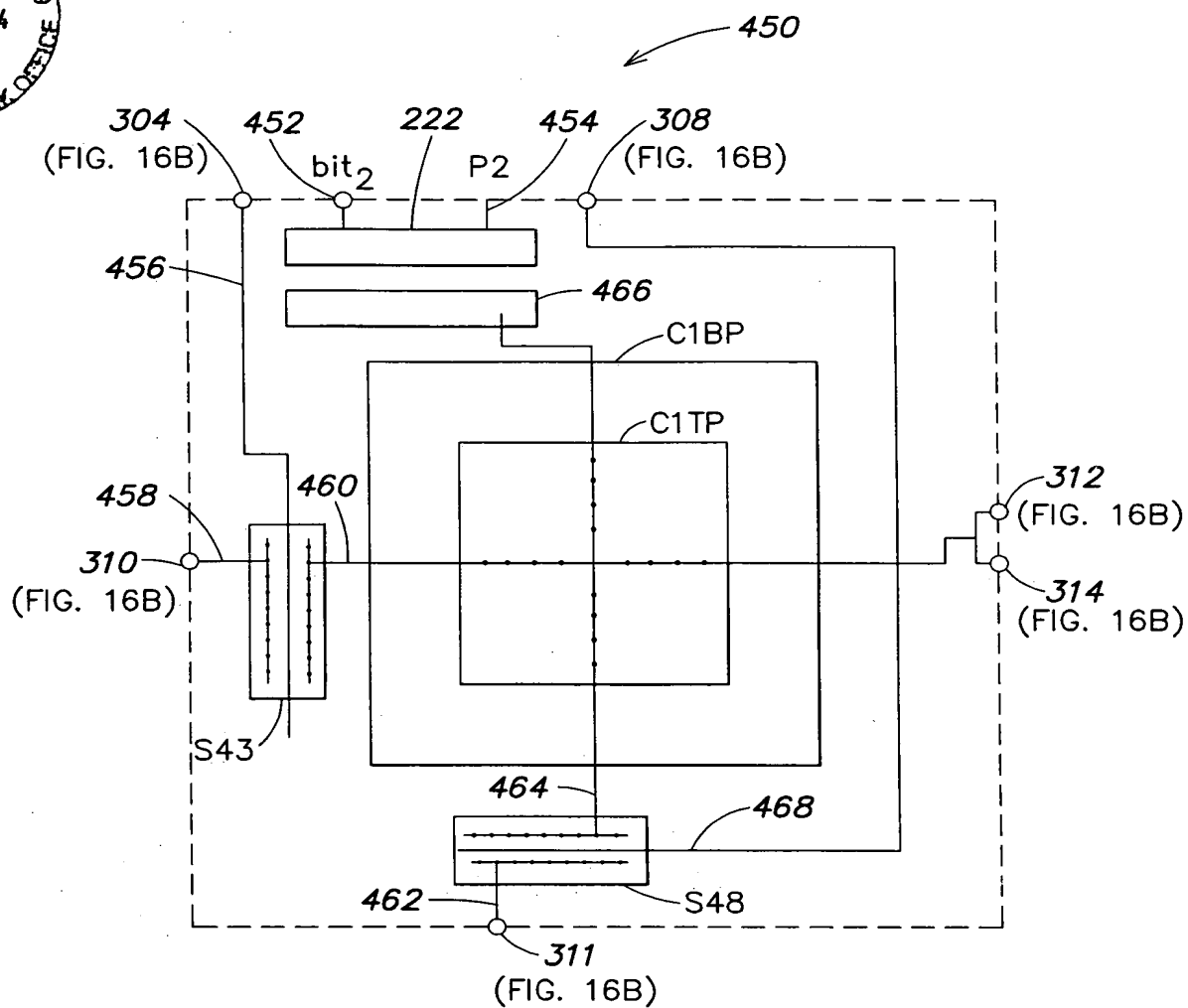
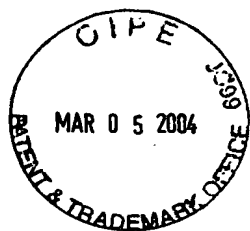
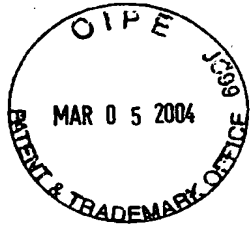


FIG. 28A



37/46

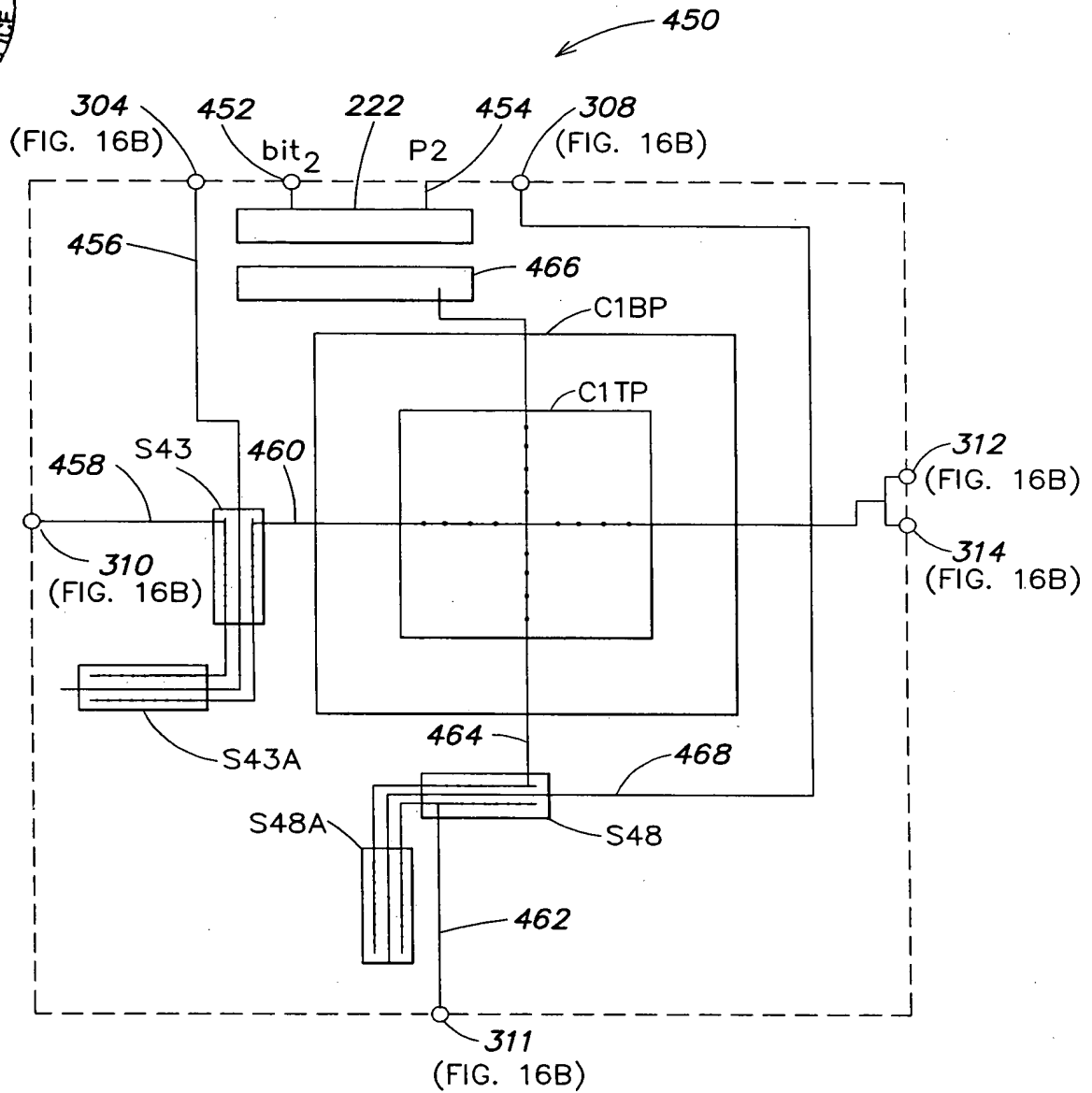
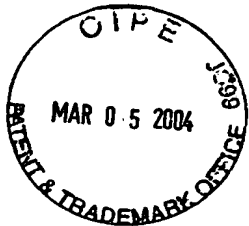


FIG. 28B



38/46

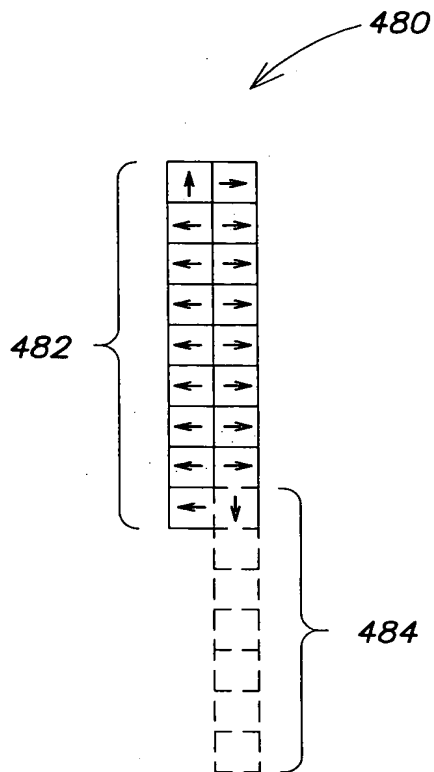
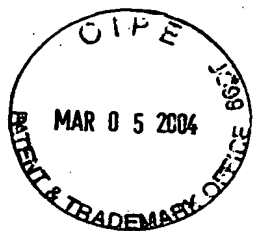


FIG. 29



39/46

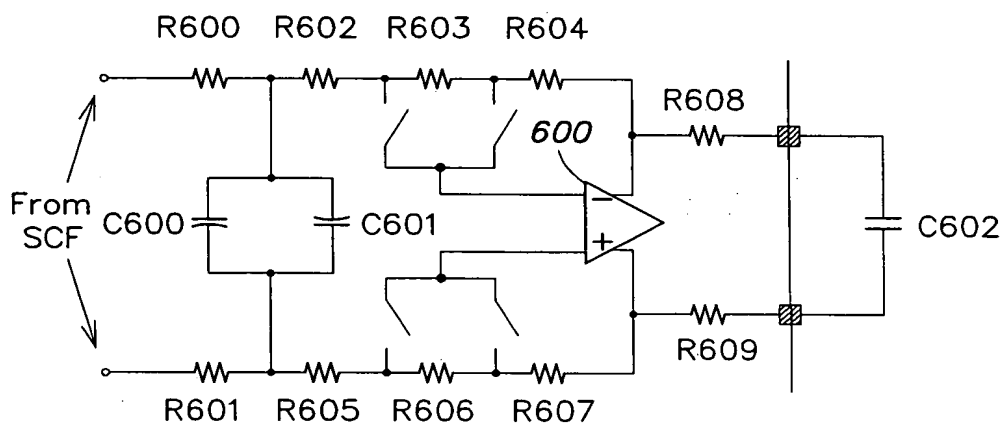


FIG. 30

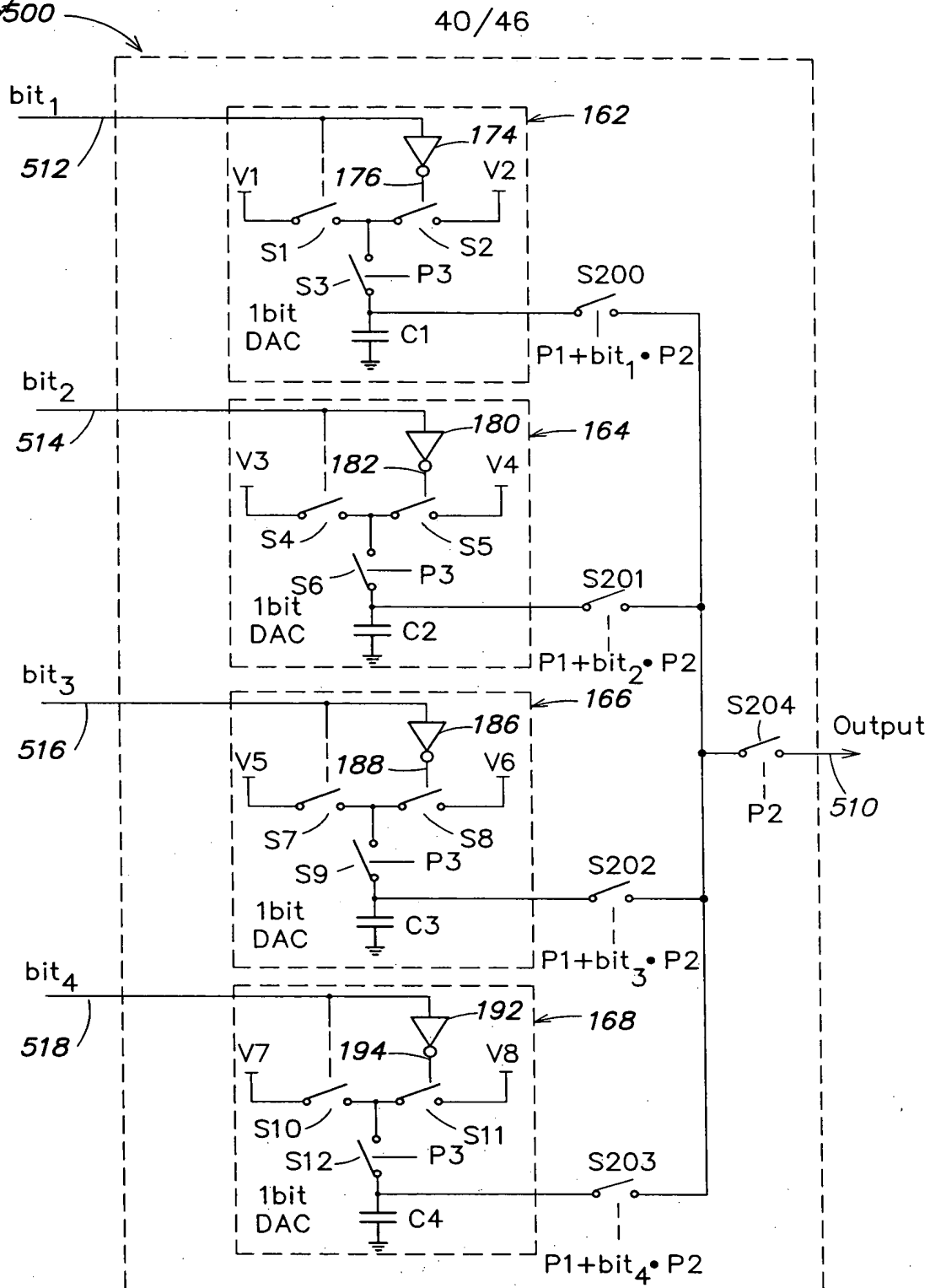


FIG. 31

41/46

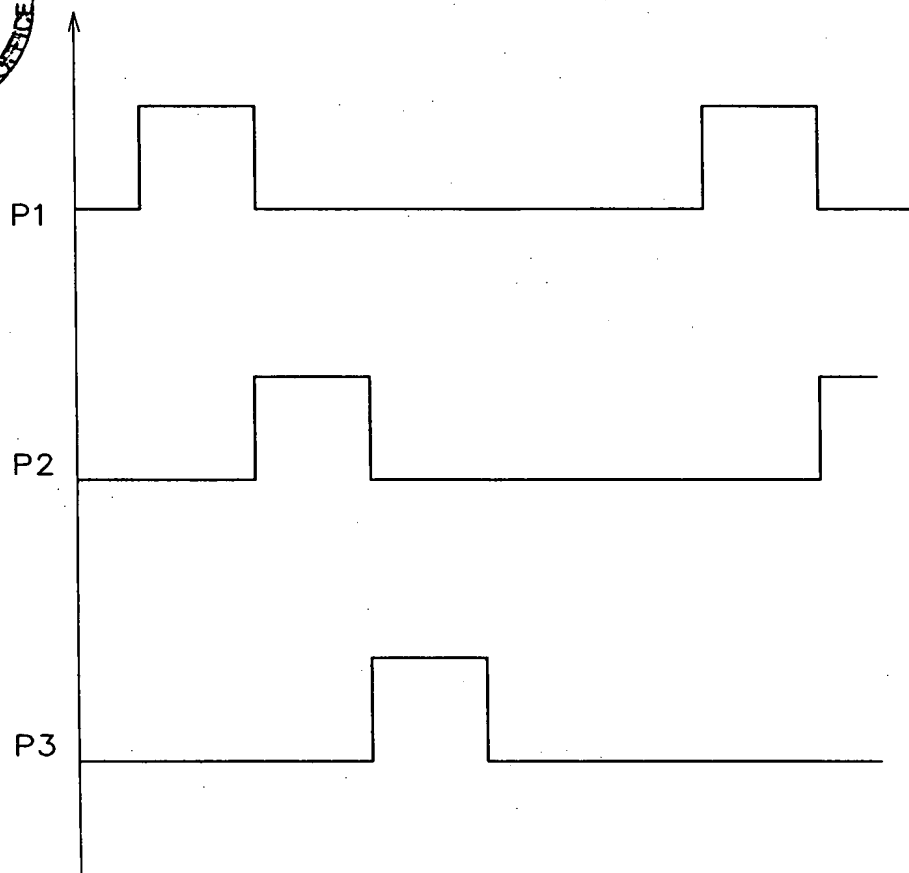
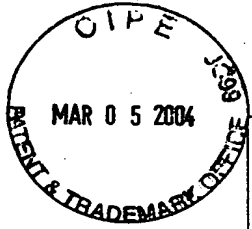


FIG. 32



42/46

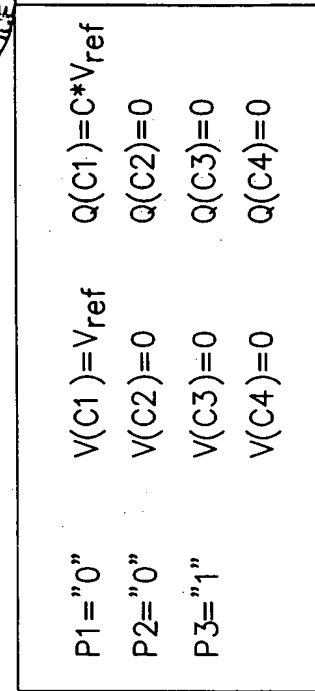
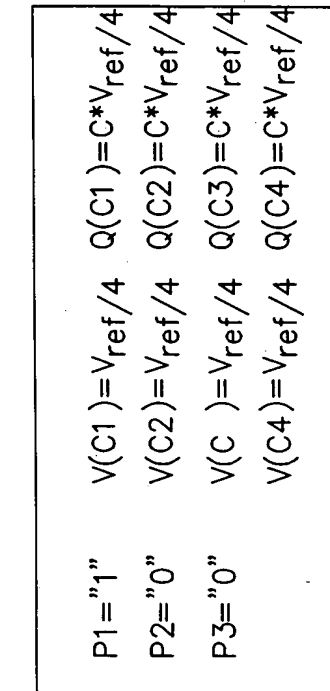
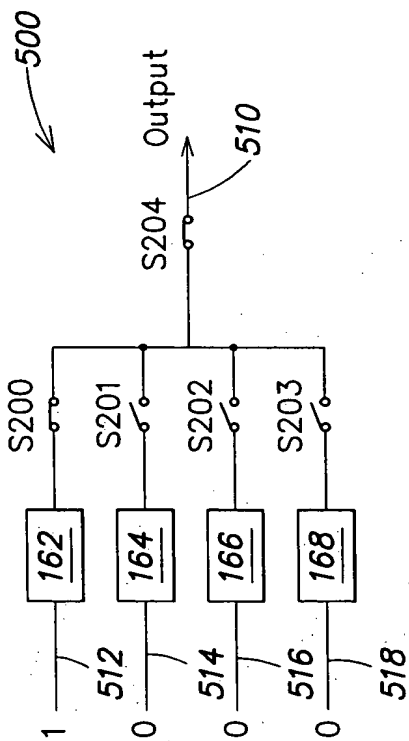
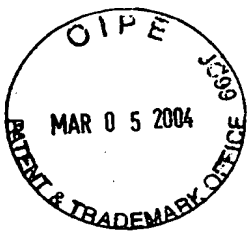


FIG. 33A



Q delivered to
 output terminal
 is $Q(C1) = C \cdot V_{ref}/4$

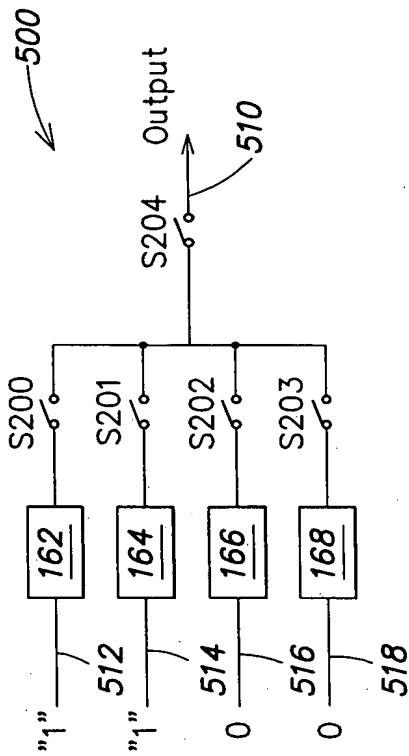
FIG. 33B



P1 = "0"	$V(C1) = V_{ref}/4$	$Q(C1) = C \cdot V_{ref}/4$
P2 = "1"	$V(C2) = V_{ref}/4$	$Q(C2) = C \cdot V_{ref}/4$
P3 = "0"	$V(C3) = V_{ref}/4$	$Q(C3) = C \cdot V_{ref}/4$
	$V(C4) = V_{ref}/4$	$Q(C4) = C \cdot V_{ref}/4$

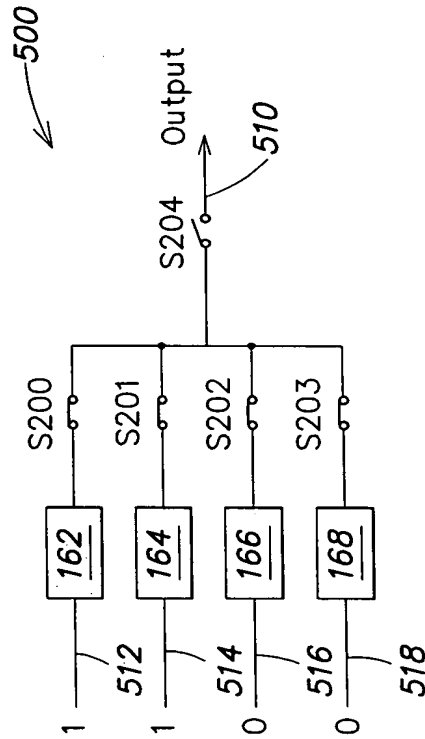
Q delivered to
output terminal
is $Q(C1) = C \cdot V_{ref}/4$

FIG. 33C



P1 = "0"	$V(C1) = V_{ref}$	$Q(C1) = C \cdot V_{ref}$
P2 = "0"	$V(C2) = V_{ref}$	$Q(C2) = C \cdot V_{ref}$
P3 = "1"	$V(C3) = 0$	$Q(C3) = 0$
	$V(C4) = 0$	$Q(C4) = 0$

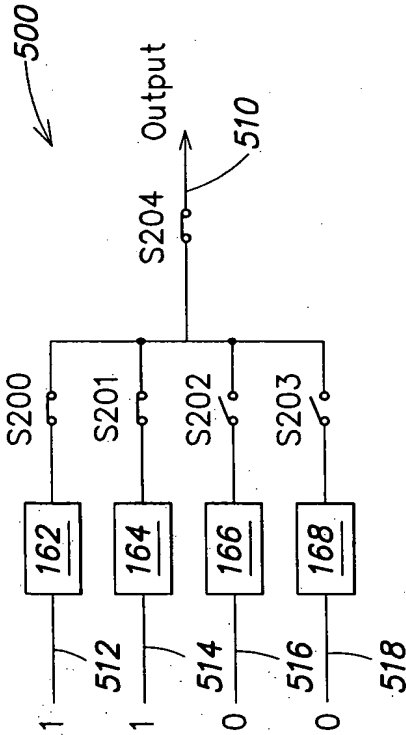
FIG. 34A



P1 = "1"	$V(C1) = V_{ref}/2$	$Q(C1) = V_{ref}/2$
P2 = "0"	$V(C2) = V_{ref}/2$	$Q(C2) = V_{ref}/2$
P3 = "0"	$V(C3) = V_{ref}/2$	$Q(C3) = V_{ref}/2$
	$V(C4) = V_{ref}/2$	$Q(C4) = V_{ref}/2$

Q delivered to output terminal
is $Q(C1) + Q(C2) = C \cdot V_{ref}/2 + C \cdot V_{ref}/2 = C \cdot V_{ref}$

FIG. 34B



P1 = "0"	$V(C1) = V_{ref}/2$	$Q(C1) = V_{ref}/2$
P2 = "1"	$V(C2) = V_{ref}/2$	$Q(C2) = V_{ref}/2$
P3 = "0"	$V(C3) = V_{ref}/2$	$Q(C3) = V_{ref}/2$
	$V(C4) = V_{ref}/2$	$Q(C4) = V_{ref}/2$

Q delivered to output terminal
is $Q(C1) + Q(C2) = C \cdot V_{ref}/2 + C \cdot V_{ref}/2 = C \cdot V_{ref}$

FIG. 34C

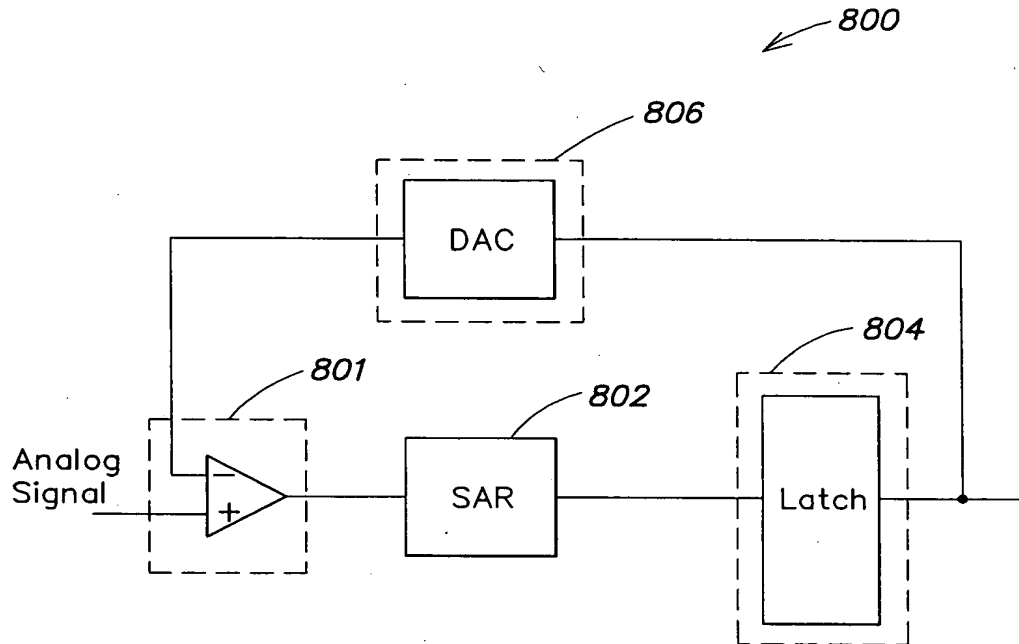


FIG. 35